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Chemical Week

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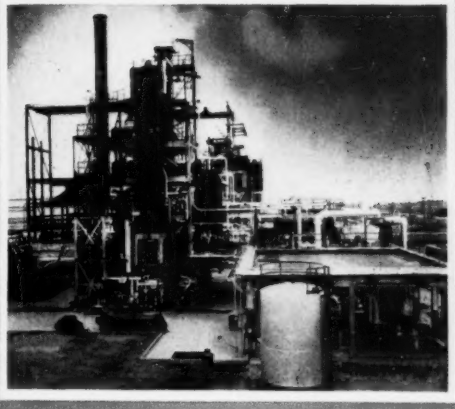

Women employee's work clothes can make or break your industrial relations . . . . . p. 10

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More on the go—by land, sea and air; that's behind the boom in motion-sickness drugs . . p. 20

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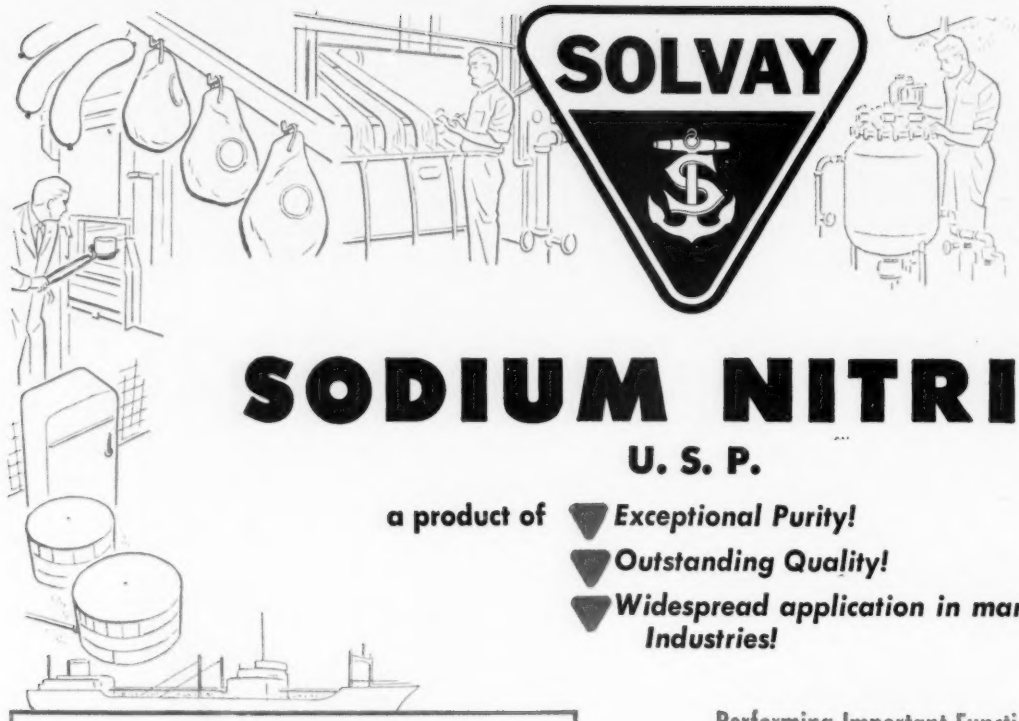

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Chemical Week

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OPINION . . . . .

Barge to Sioux

To THE EDITOR: In your recent news article "The West's Dilemma: Natural Resources Plentiful but Remote" (*Nov. 28*), CW's spyglass fogged over when it passed over the barge harbors of Minneapolis-St. Paul; Sioux City, Iowa; and Omaha, Nebraska. Perhaps this information will make these plentiful natural resources more economically accessible. . . .

Regular barge service is available on both the Mississippi River as far north as Minneapolis-St. Paul and the Missouri River as far north as Omaha. Further regular service to Sioux City is proposed. . . .

Perhaps your fuel reserves chart could now show . . . under the caption "Transportation Distance to Barge or Seaport":

North Dakota—Fargo to Minneapolis-St. Paul
262 miles (460 miles shorter than to Kansas City)

South Dakota—Rapid City to Omaha, Neb.
552 miles (170 miles shorter than to Kansas City)

Rapid City to Sioux City
473 miles (249 miles shorter than to Kansas City)

Direct rail service to the above barge harbors is available. . . .

DAVID S. CARSON
Area Development Dept.
Northern Natural Gas Co.
Omaha, Nebraska

Fogged spyglass, mayhap, so we'll add these barge routes to our round-up.—ED.

Margarine Yellow

To THE EDITOR: In your news story (*Dec. 12*) on FDA decertification hearings on coal-tar colors . . . you refer to "the vegetable-derived annatto dye of carotene." Annatto extract and carotene are unrelated products . . . their only similarity being that they both belong to the broad spectrum of compounds designated as carotenoids. . . .

Annatto color is found only in the fruit of "Bixa orellana"—has no vitamin A activity . . . carotene is the natural pigment in butter . . . a host of fruits and vegetables . . . is the main source of vitamin A for humans. . . .

Carotene has been prepared for many years from carrots, palm oil, dehydrated alfalfa. . . . With the advent of high-quality carotene a number of large margarine companies have instituted the use of carotene . . . a colorant and source of vitamin A. . . . In 1951 the FDA standards for margarine were amended to specifically allow this use. . . .

Although carotene is sold on the basis that 0.6 microgram corresponds to 1 USP vitamin A unit, a mounting body of evidence is accumulating showing a vitamin activity considerably in excess of this figure. . . .

Production of carotene could undoubtedly be stepped up to supply all the needs of the butter and margarine industry. . . .

HENRY M. ESPOY
Chief Chemist
Barnett Laboratories
Long Beach, Calif.

Right enough. As we said, "Carotene has the advantage of supplying vitamin A in addition to color," and, "Whether annatto imports could be stepped up to meet butter and margarine needs is questionable."—ED.

Paper Research

To THE EDITOR: I am very interested in the graphic presentation of the CW REPORT on research (*Dec. 12*) . . . but why did you lump paper with lumber and wood products?

Surely the pulp and paper industry, as the fifth ranking industry in our economy, should be reported by itself.

Presenting research data on paper and lumber industries, as one unit, is like adding oranges and goats to find out how many fruit there are. The lumber industry, by its very nature, plus the fact that there are thousands of small producers, spends only a very small fraction on research as compared with the paper industry . . .

JOHN C. W. EVANS
Editor
Paper Trade Journal
New York, N. Y.

Good point. Our report was, as we noted, a digest of "Spending for Industrial Research" compiled by Harvard Business School. Lumber and Wood Products and Paper and Allied Products were analyzed separately by Harvard, but for chart purposes the data-collectors totaled the statistics.—ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

NEWSLETTER

When government officials meet with chemical industry men again this month (CW Newsletter, Dec. 26, '53), it's a moot—and important—question whether it will be called a council, committee, or conference.

It's more than a question of semantics, for because of antitrust objections raised by the Justice Dept., Commerce Secretary Sinclair Weeks has watered down his plan for industry advisory councils. These councils were to take the place of the industry advisory committees, first set up under the Defense Production Act, and now under Commerce's Business and Defense Services Administration.

Now, it looks as if Commerce will sponsor industry advisory conferences to advise on "broad-gauge policies and the general economy"—not councils like Interior's National Petroleum Council. Main difference: a council would have paid staff, industry chairman and fixed membership for two-year terms. A conference would have government men as staff and chairman, no fixed membership.

If this month's meeting is a conference, and if choice of participants rests with Division Director Norman Hathaway, present committee members will form a nucleus of those invited.

•

Though it's only been in business for a month, the rubber producing facilities disposal commission is already in the thick of discussions.

It has already received over 100 "expressions of interest" in the 26 butadiene, styrene and copolymer facilities it hopes to sell or lease. These approaches came in response to its request for informal discussions ahead of the formal bid deadline, May 27.

•

Are you cleared for classified defense material?

If your clearance took in only "restricted" data, better see about getting a higher clearance. Eisenhower's abolition of the "restricted" stratum was supposed to take material out from under the classification program. In practice, though, most items will move up one notch to "confidential."

That means your contract and all the material that pertains to it—as well as the people who have access to plans and specifications—may have to get a higher security clearance. In addition, "confidential" matter requires special handling—storage in a locked combination safe, transmission by registered mail in two envelopes, etc.

There's no change in secret, top secret, AEC's "Q" or NATO's classifications.

•

Du Pont has filed with the Securities & Exchange Commission a request to allow it to acquire 28,735 shares of the common stock of Canadian Industries Ltd. The filing is required under the Investment Company Act, since Du Pont is controlled by Christiana Securities Corp., a registered investment company.

The shares are to be acquired from Imperial Chemical Industries of Canada, Ltd., a newly organized wholly owned subsidiary of Britain's ICI. The shares in question, for which Du Pont will pay $29/share—a total of $833,315 (Canadian)—are to be transferred to ICI of Canada by the parent company just before the sale.

SEC gave interested persons until this week to ask for a formal hearing on the question. The sale is one of the steps in the compliance of Du Pont and ICI with the antitrust case decision that requires, among other points, disposal of jointly held CIL.

•

A hard line on corporate mergers is being taken by the new Republican Federal Trade Commission. In its first decision, the commission ruled that a "prima facie" case of illegal mergers has been established against Pillsbury Mills as a result of its acquisitions of competing producers of flour and home baking mixes. In so doing, FTC specifically overruled one of its trial examiners, who had dismissed the case against Pillsbury. As things stand now, Pillsbury still has its chance to prove that its acquisitions are legal.

The landmark decision by Chairman Howrey said that the Pillsbury mergers changed the pattern of competition—and that the change constitutes "a move away from healthy competitive conditions." This is the sort of situation that prompted Congress a couple years ago to close the loophole in the antimerger section of the Clayton Act.

Howrey also noted that the same trend has been seen in other industries. In some of them, he said, "competition between big companies continues to protect the consumer interest. But as we understand it, it was this sort of trend that Congress condemned and desired to halt when it adopted the new Clayton Act antimerger provision."

•

Colorless and unplastic must be the Russian's lot. The official government newspaper Izvestia, has now added new items to the list of products turned out in insufficient quantities by the Ministry of the Chemical Industry: indigo dyes, sulfur dyes for cotton, mordants for wool and cotton, nitro dyes for hides, acrylic emulsions, polyvinyl chloride and plasticizers.

•

Shipping a piece of plastic pipe is sometimes almost as costly as making it. That's why Bassons Industries Corp. claims it's cheaper to make it on the spot with its new two-truck setup.

One truck carries chopped glass and resin raw materials, the other is the fabrication workshop. They both move to the oil field, chemical plant, or wherever the pipe is to be laid down.

•

U. S. metal producers—for the most part worried by declining defense orders and low-cost foreign competition—may be heartened by a directive issued last week by the Office of Defense Mobilization. The revised order (replacing one put out in July), urges the General Services Administration to step up buying of 29 strategic materials for the nation's stockpiles.

Zinc, copper and aluminum are on the list of items for which procurement is way behind schedule.

•

For the first time, a chemical company was among the firms sponsoring a float in the annual Tournament of Roses at Pasadena, Calif. Monsanto Chemical teamed up with the Southern California Florists' Assn. this past New Year's Day. Roses—greenhouses—soil conditioners—it all hangs together in a logical sequence.

. . . The Editors

BUSINESS & INDUSTRY . . .

Tale of Chemical Terror

"I could a tale unfold," the kingly ghost assures young Hamlet (Act I, scene 5), "whose lightest word would make thy knotted locks to part, and each particular hair to stand on end, like quills upon the fretful porcupine."

A similarly hair-raising tale now is being unfolded by a number of physicians in the United States. Its lightest word is that the use of modern organic insecticides has been accompanied by sharp increases in number of cases of various diseases; and its more somber implication is that in trying to poison pests rapidly, the people of this country are poisoning themselves somewhat more slowly.

Obviously, the tale is one that might easily stir the public into demanding prompt, possibly rash action on the part of the Congress. Those who doubt that this country could ever be stampeded into such an arbitrary move as the banning of all chemical insecticides might do well to remember that prior to 1918, lots of people thought it inconceivable that the nation would try to prohibit the use of alcoholic beverages.

Let Nature Do It: And total abolition of chemical insecticides is exactly what these doctors are after. Their leading spokesman, Morton S. Biskind of Westport, Conn., recently had Washington officials up in arms with his latest article,* in which he contends: "As many workers have now shown, by maintaining proper fertility of the soil, it is possible without the use of insecticides to raise crops showing little or no damage from insects."

Dr. Biskind's article, although published in a technical journal of only about 3,500 circulation, has succeeded in raising a storm on this topic because it has been quoted in newspaper articles. One of those newspaper articles began like this:

"The insecticide, DDT, and its even more poisonous chemical cousins were charged today with being the roots of much evil now afflicting man and beast." The columnist follows with numerous pungent excerpts from Biskind's paper, winding up with: "Unfortunately, today contamination of food is virtually universal. Even if the farmer does not use the new insecticides, it is a rare food that escapes contact with insecticides in storage, shipment, processing plants, warehouses and stores."

Logic Is Challenged: Basis of Biskind's theory—which he has advanced in previous medical papers and in testimony before the Delaney chemicals-in-food committee in 1950—consists of propositions that now are generally accepted by recognized scientific authorities, such as the U.S. Public Health Service and the Food & Drug Administration. These are that DDT and other insecticides are more or less toxic; that DDT and other chlorinated cyclic hydrocarbons tend to be stored up in human and animal body fat; that such insecticides can pass into the milk of cows, goats, and human mothers; that DDT is not too readily washed off of apples and similar food products; and that the incidence of some diseases has been increasing since 1945.

NACA'S HITCHNER: On "spontaneous generation" of diseases, he's a skeptic.

What the opposing faction attacks in Biskind's argument is the reasoning by which he tries to tie those facts together. For example, one FDA official says that penicillin came into general use at about the same time as the organic insecticides, so why not blame penicillin for some of the increase in diseases? A life insurance statistician says that if the insecticides must be blamed for more cases of polio and heart diseases, why not credit insecticides for increasing human longevity and decreasing the infant mortality rate?

Most Angered Reaction: With Congress scheduled to convene next week and with consideration of the Miller bill likely to bring the insecticide dispute even onto the floor of either house, the National Agricultural Chemicals Assn. was quick to strike back at the Biskind thesis.

"Reliable scientists have proved," declares NACA Pres. Lea S. Hitchner, "that most of these diseases are caused by organisms which are alive and capable of reproduction. Does Dr. Biskind want us to believe that these diseases arise from spontaneous generation when the animal is in contact with DDT?"

Authorities on the subject indicate that there's danger in going to the extreme either way. Wanton, unlimited use of insecticides certainly would lead directly to the death of many humans, as well as birds and animals (even now, many honeybees are DDT casualties). A general ban on insecticides would imperil the nation's food supply. There's great need for continuing research on all phases of the insecticide problem. Meanwhile, the lay public should be alerted to be on guard against sweeping statements from any faction, and Congressmen would do well to acquaint themselves with the research work already done on this topic—notably by the Army's Environmental Health Laboratory, the Department of Agriculture's livestock laboratory at Kerrville, Texas, and the Public Health Service's laboratory at Savannah, Ga.

So far, those agencies are still standing pat on the joint statement issued in April '49 after extensive testing: "There is no evidence that the use of DDT in accordance with the recommendations of the various federal agencies has ever caused human sickness due to the DDT itself . . . despite the fact that thousands of tons have been used annually for the past four or five years."

* "Public Health Aspects of the New Insecticides," in Nov. '53 issue of *The American Journal of Digestive Diseases*, pp. 331-341.

Eye on the Long Term

Like the small boy who discovers mittens instead of the bicycle he expected under the Christmas tree, officials of Texas City Chemicals Co. this week may be asking themselves what became of their hard-sought prize.

For the record, all major goals of their $7-million dicalcium phosphate plant at Texas City have been gained. Though not yet up to capacity, the plant is now producing 80% of dicalcium phosphate for mineral supplement, 20% for fertilizer. Facilities to produce a by-product (uranium) for the Atomic Energy Commission are rolling along smoothly.

But what looked to be the big money-gainer some three years ago—the commercial animal feed market—is today at best shaky. And to complicate matters, another major producer—International Minerals Co.—is due to enter the field soon.

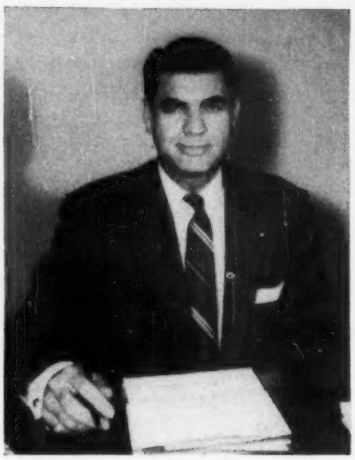
Regardless of the immediate outlook, Texas management exudes confidence, says it's sure the long-range picture for both its major products is healthy. "Meanwhile," they say, "it shouldn't be a problem to dispose of all fertilizer material that can be produced." Gulf Coast soil is notoriously deficient in phosphorus; a repeat performance of last summer's drought isn't likely; farm prices may well level off.

Bows All Around: Not greatly disturbed by its slipping market, Texas City founders can claim to have come a long way since plans for operation were conceived back in 1950. Like any other project that has no real precedent for its guidance, years of formulation were involved. Nobody, for example, at first envisioned a $7-million plant, with an annual capacity of over 100,000 tons of feed and fertilizer supplement; nobody thought the AEC would lend a hand in the plant's construction.

Initial planning called for a plant roughly one-quarter the size of the one now in operation; nobody really knew whether W. R. Seyfried's process for dicalcium phosphate processing (though based on recognized engineering operations) would present unforeseen difficulties.

Then two events set the ball rolling in earnest. S. A. Winfrey, executive vice-president and director of Texas City Chemicals became convinced there was a real need and potential market for dicalcium phosphate in the U.S.—primarily as a feed supplement. His enthusiasm fired financiers W. L. Pickens, H. H. Coffield and R. L. Wheelock. And AEC, to persuade Texas City to extract uranium from its phosphate rock (as a supplementary operation), dealt out priorities for construction materials, necessary supplies.

Then, admit executives, the real work began. No plant like their proposed plant had, to their knowledge, been built before. The design was new, required exhaustive detailing. The idea was Seyfried's own—developed after years of study in the conviction that the time was not far off when farmers and ranchers would have to turn to more efficient feeds and fertilizers to cope with deteriorating lands. The patent had been assigned to Chemico under a non-exclusive use license. But, chiefly for economic reasons (and on the advice of Battelle Memorial Institute, which was called in for consultation), first designs were revised in accordance with AEC process requirements.



SIGNAL CALLER: Executive vice-president Winfrey maps strategy.

Complications piled up:

• Because the plant was to be enlarged a couple of times over the original scheme, Texas City planners found they had to have more spent sulfuric acid for processing requirements. The solution: a contract with Carbon and Carbide Chemicals Co., whose property abuts on Texas City's own, whereby Carbide would buy sulfuric acid from TCC (on a rental basis) and pipe it back to TCC's dicalcium phosphate plant at half-strength. Double advantage for Texas City: the spent acid would be sufficiently strong for dicalcium phosphate production; double use of the acid would cut plant costs sharply. Remaining acid would be sold to other industrial customers.

• Engineering and construction was a long-drawn-out affair. Chemical Construction was charged with building the plant on a cost-plus-fixed-fee basis, guaranteed to put up a unit capable of producing 80% feed-grade, 20% fertilizer-grade material— a split calculated to make the operation financially profitable.

But all the problems were ironed out; ground was broken on May 8, '52. Contracts for 350 tons/day of crushed phosphate rock, strip-mined in Florida, were sewn up with American Agricultural and Chemical Co.; arrangements were made with Texas Gulf Sulphur Co. to ship molten sulfur by tank car from Newgulf and from sources owned by Jefferson Lake Sulphur Co. Salt was obtained from International Salt Co., shipped in at the rate of 5-6,000 tons/year from Avery Island in Louisiana.

Encouraging the backers throughout the long months of construction was the rise in production of commercial mixed feeds in the U.S.—from 25 million tons in 1946 to 32.2 million tons in 1951. Since some phosphate supplement is added to most raw mixed feeds, the obvious conclusion was that the new plant was coming in "just at the right moment." Backing it up: U.S. Dept. of Agriculture estimates underscored the contention, predicted that the requirements in 1954-55 for phosphorus feed supplements would exceed by 125,000 tons the supply from then-existing plants.

Bradley and Baker, TCC's sales agents, advised company officials that various furnace producers of phosphorus were eyeing the dicalcium phosphate business as a means of diverting a portion of what they interpreted as " a temporary oversupply of phosphorus capacity." Shea Chemical Co. (*CW Feb. 7, '53*) was booked as being one of the most active phosphorus producers that might offer serious competition to the budding Texas City enterprise. But the possibility of Shea's being long-term competition was largely discounted. Consensus was that Shea's interest in dical would be purely a willingness to accept a lower return for a short time in order to operate at capacity.

Texas City management remained convinced that their plant's location (with respect to areas reached by either rail or by water) would permit them to meet all competition for a substantial amount of tonnage of like quality. Cost of production was the big ace in the hole: with the low-cost sulfuric acid arrangement, Winfrey figured he could sell dicalcium phos-

BALL CARRIER: Vice-president, general manager Koepf handles production.

phate "as low as anyone." Sewing it up: TCC's contract with Carbide was a 15-year deal at a rate of 270 tons/-day out of a total 300 ton/day capacity; plans were afoot "for further production facilities, which would call for the use of the sulfuric acid a third time." The latest idea: a plan to reclaim sulfuric from waste calcium sulfate, use it in the manufacture of ammonium sulfate.

TCC's dealings with the AEC are still cloaked by security regulations, but it's clear that negotiations on further projects by the two are in the offing. At present, no production figures on TCC's uranium operations have been released; the uranium extraction process is carried on as a completely separate function from other operations at the plant.

"Meanwhile," says E. H. Koepf, general manager, "just as in accordance with plans, dicalcium phosphate production today is running on schedule." For the books, the plant went onstream officially last Nov. 1; today all departments are operating, but as yet not at capacity. The company boasts a 120-acre plant site, is currently starting preliminary work toward expansion "due to get under way when all the last kinks in the present plant are smoothed away."

But what's ahead for Texas City Chemicals no one can confidently predict. International Mineral's Florida mineral supplement plant is scheduled to enter the field soon; TCC officials admit they know at present of no new application for their major product.

Banking on "a superior product due to method of processing" and a comeback in farm prices, top management says it's sure that the long-range outlook is good and adds that it's just a question of time.

Hard-to-get Help

For chemical companies, the "relief" offered in U. S. tariff laws seems to be just out of reach. Of the four chemical company requests for relief under the peril point and escape clause procedures in recent years, two were turned down by the Tariff Commission, one has been abandoned, and the fourth faces a stiff fight in the federal courts as well as before the Commission.

Following the latest bid for relief—asked by Linde Air Products, a division of Union Carbide and Carbon (*CW Newsletter, Dec. 19*)—the importer in the case has gone into U. S. District Court, New York, seeking to forestall action by the Tariff Commission to cut off the flow of German-made synthetic gems into the U. S.

W. C. Von Clemm, described as the major U. S. importer of German star sapphires and rubies, contends that the Tariff Commission should not have jurisdiction in the case. He declares that the German gems are made by a process different from the one covered by Linde's patent; asserts that the Linde patent is invalid because of insufficient disclosure of methods; and asks for $3 million in treble damages.

Prior Linde Triumph: Up to the time Von Clemm filed that civil suit last month, Linde had considerable hope that the Tariff Commission would recommend to the President that all imports of these products be banned. The Eisenhower administration feels that the case doesn't involve its "trade, not aid" policy, only a legal question of whether the patent law has been violated; and Linde's patent was upheld in previous litigation in U. S. courts.

In preliminary hearings before the Tariff Commission, testimony by Linde representatives was that the German stones are being made by the Burdick-Glenn process* developed by Linde at the request of the U.S. government during World War II; that because of low wages in Germany, the imported stones sell for $2 less per carat than U.S.-made gems; and that imports have been rising steadily during the past year, are approaching the $10 million/year mark.

Now the importer is striking back through the court. Von Clemm insists that the basic issue is whether Linde's patent has been infringed, adds that this issue hasn't been adjudicated and that Linde hasn't served notice of infringement. Also, says Von Clemm's complaint, Linde's synthetic gem operations are in violation of the Sherman Antitrust Act. Von Clemm wants the court to throw out the Linde patent and to enjoin that firm from taking further action before the Tariff Commission.

Linde's anticipated difficulty in getting relief in this case serves to illustrate the chemical industry's plea for amending the tariff laws' "injury test." Under the SOCMA-proposed amendment (*CW, Dec. 19, '53*), it would be relatively easy for Linde to show the Tariff Commission that in this synthetic gem case it's being injured "by actual or relative increases in imports."

* Fusing alumina with about 0.2% titanium dioxide and either chromium (for ruby) or iron (for sapphire) compounds into an approximately cylindrical crystal called a boule, which is reheated and then cut in gemstone form.

Fired, With Praise

Chemical company management, which also gets conflicting pressure from various sources on the touchy topic of air pollution, can sympathize with Gordon Larson, for whom a successor is being sought this week by the Los Angeles County Board of Supervisors.

Larson, who for more than four years had headed the county's air pollution control district, is being removed from that job despite his reputation as a leading authority on pollution control. The board praised Larson's honesty, technical ability; but says it wants a man who'll restore confidence in the district's operations.

Corporate Shake-up

Close on the heels of Monsanto's recent corporate reorganization (*CW, Nov. 28*), American Cyanamid Co. has decided to shake up its divisions and streamline management operations. The plan (effective Jan. 1) rings down the curtain on Calco Chemical and the Petrochemicals Divisions, creates four new divisions—Research, Organic Chemicals, Fine Chemicals, Pigments. Organic Chemicals will merge and consolidate former operations of Calco and Petrochemicals; Fine Chemicals will take over the Princeton, N. J., plant recently purchased from Heyden Chemical Co. and handle domestic sales of bulk antibiotics and pharmaceuticals in addition to animal feed products (formerly under Lederle Laboratories Div.); Pigments will take over responsibility of production and sales of titanium dioxide and other pigments, hitherto managed by Calco.

The shake-up means that American Cyanamid is now a nine-division company—patterned much in the manner of other major chemical companies.

COMPANIES . . .

Majority stockholders have purchased the holdings of minority stockholders in Utex Exploration Co., Moab, Utah, for $3,272,500—will go ahead with plans to build a $3-million uranium ore mill. Minority stockholders had blocked the move to expand uranium operations on the Colorado Plateau; now company officials say they'll get under way within a matter of weeks.

•

Fluor Corp., Ltd., Los Angeles, has been awarded the contract to build Shell Chemical Corp.'s projected allyl chloride and chlorohydrins plant at Norco, La.—first step in Shell's current glycerine expansion program. Output from the new unit should swell Shell's glycerine production by some 25 million lbs./year, also make available substantial additional quantities of epichlorohydrin and Epon resins. Completion is scheduled for late this year.

•

Financing arrangements have been completed for the Washington Processing Co.'s $10-million refinery to be built at Tacoma, Wash. Work is expected to begin early this year—provided the port of Tacoma proceeds with a scheduled dredging project—with refinery operation slated for mid-'54. Initial plans call for processing of 10,000 bbls./day of crude oil, with an eventual goal of 25,000 bbls./day. Already the company has purchased a 52-acre site in Tacoma's tideflats industrial area, is bidding on another 50 acres immediately adjoining it.

•

Stanolind Oil and Gas Co. has called upon the Lummus Co., New York, to carry out its projected investigation of the physical condition of Carthage Hydrocol, Inc.'s synthetic gasoline plant at Brownsville, Tex. The company's interest in the Carthage plant stems from its ownership of an adjoining plant at Brownsville, production from which depends upon Carthage by-products—a source shut down since Carthage closed up shop last August.

Since its new raw materials were exhausted, Stanolind has kept a skeleton maintenance crew at its plant, in November arranged with the Reconstruction Finance Corp. to undertake studies that may lead (if Stanolind likes what it finds) to acquisition of Carthage stock. At present, however, Stanolind does not share in ownership of the Carthage plant.

•

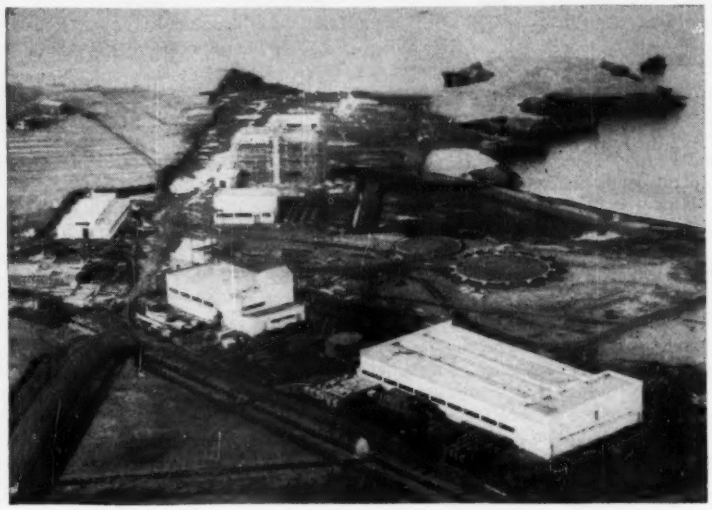
Seiberling Rubber Co. has organized a new plastics division, is already in production on a pilot-plant basis. It's the first major product diversification for Seiberling since World War II. Division headquarters, temporarily located at the Akron home office, will be located at Newcomerstown, O.— a plant due for completion by mid-'54. Initially emphasis will be placed on processing chemicals — particularly polyvinyl chloride—rather than manufacturing.

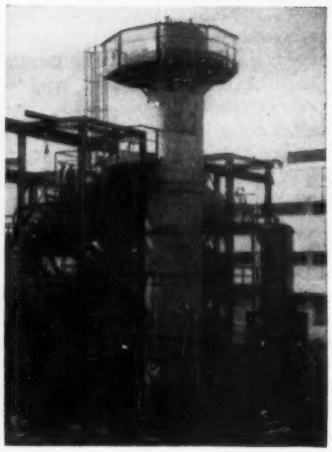
•

Shareholders of the Vitro Manufacturing Co. have ratified a plan of reorganization and merger with the parent company, Vitro Corp. of America. The merged corporation will be known as Vitro Corp. of America, with offices in New York, will include five divisions—Vitro Manufacturing, Vitro Uranium, Canonsburg Rare Metals, Vitro Laboratories, and Vitro Engineering. Reason for the move: advantages to be gained from a unified operational and financial management.

EXPANSION . . . .

Petrochemicals: Officials of Warren Petroleum Corp., Tulsa, Okla., now say the company's proposed petrochemical plant, originally slated for construction on the Houston Ship Channel, will be built at Conroe, Tex. Reason for the shift in plans: decision to place the new facilities as close as possible to the Midland Gasoline Co.'s LPG producing units—of which Warren is part owner. Cost of the plant is now estimated at $1.5 million; plans call for an annual production of 2.5 million lbs. of pentaerythritol, 4 million lbs. of methanol, 2 million lbs. of acetaldehyde.





Iceland Independence

THANKS TO ONE chemical enterprise, Fertilizer Plant, Inc., Iceland will soon be able to claim for itself the distinction of being a chemical-exporting, not wholly importing nation. Hydrogen and nitrogen have already been produced in quantity; ammonia units should be running within the week; nitric acid facilities are due onstream the latter half of January; ammonium nitrate (at the rate of 18,200 metric tons/year) should be produced by the first of February. Half the ammonium nitrate is tentatively scheduled for export, say Singmaster & Breyer officials (builders), but when home consumption grows, exports may taper off somewhat.

World Nitrogen Supply

(in thousands of metric tons)

Year	Production		Consumption	
	For Agriculture	For Industry	For Agriculture	For Industry
1947-1948	2,880	520	2,785	520
1948-1949	3,440	570	3,180	570
1949-1950	3,890	670	3,525	670
1950-1951	4,035	770	3,975	770
1951-1952	4,375	840	4,180	840
1952-1953	4,880	930	4,860	930
1953-1954	5,315	1,040	5,310	1,040
1954-1955	5,600	1,100	5,600	1,100

Barring U.S.S.R. Production

Accent on Asia

The New Year will herald a rash of new nitrogen plants, according to McGraw-Hill World News surveyors, but the bulk of the demand for additional fertilizer requirements will still rise out of the Far East. Latest reports estimate that over the 1952-53 period consumption of nitrogen in Europe and Egypt increased 9%; in the United States, 20%; in Asia, 26%; and in all other countries, 4% over the previous 12 months.

For 1953-54, the picture's calculated to shape up fairly similarly: up 6% in Europe and Egypt, 14% in the U.S., 13% in Asia, and 3% in all other countries. What's more important, however: the fastest growing nitrogen center in the world today (by both production and consumption standards) is the area bounded on the east by Korea and Formosa, on the west by India and Pakistan.

Building of new plants in the United States, in the past year, has progressed about as expected. In Europe—apart from two new plants under construction in France, one in Poland, and a gradual increase in production from a bevy of existing plants in other countries—no additional capacity is upcoming. Some fairly small synthetic units are projected in South America, Ceylon, Australia and Indonesia. Chile's production (CW, *Dec. 19*) is rising, but ocean freight is an ever-limiting factor to further growth.

India, however, now has its new Sindri plant running at full capacity; Pakistan is currently building another, designed to turn out 50,000 tons of nitrogen annually.

Meanwhile, the main demand from the Far East as a whole continues to be for ammonium sulfate; for 1953-54 it's estimated that China, Korea, and Formosa alone will consume at least 300,000 tons of nitrogen in this form as opposed to 260,000 tons last year. Main credit for increased consumption goes to the U.S. government, whose loans to Far Eastern countries have (to a large extent) made the growth possible.

When production plans in Korea are concrete, researchers promise, the Far Eastern nitrogen tally will get another major push upward. For the nonce, however, such "possible" capacity is not included in world estimates for 1954-55.

LABOR

Sympathy for Companies: Chemical companies won't be alone in asking Congress to go slow and easy on "trade, not aid"; labor unions in the chemical process industries are showing that they share the companies' concern about increased imports.

• United Gas, Coke & Chemical Workers (CIO) publicized a suggestion that the U.S. government might "grant aid and assistance to American plants, workers and local communities that are seriously affected by increased imports"; and several Gas-Coke officials joined with company representatives in placing a relief request before the Tariff Commission recently.

• District 50 of the United Mine Workers has published in its official newspaper a report on the Manufacturing Chemists' Assn.'s recent statement on tariff policy. The wording of the article indicates that District 50 agrees that some vital industries require "reasonable tariff protection" to preserve their skills and facilities for full use in defense programs.

•

Court Halts Picketing: One work stoppage that was at least temporarily ended as the old year went out was the strike that had delayed completion of Standard Oil's $4-million phenol plant at Richmond, Calif. Picketing by the AFL Teamsters—who have a jurisdictional dispute with the AFL Steamfitters at this construction project—was enjoined by Contra Costa county superior court, and the contractor now is seeking a permanent restraining order. Some 450 men were kept from work during the strike, which came when the plant was within three weeks of completion.

•

Twelve-Cent Top: Chemical companies that hoisted their wage rates during the closing weeks of 1953 settled on increases ranging from 4 to 12¢/hour, mostly in the 6-8¢ range.

• Latest wage hikes going to employees represented by International Chemical Workers Union (AFL) included 7½¢/hour at the Reichhold Chemicals plant in Seattle; 4 to 7¢/hour, Harshaw Chemicals, Cleveland and Elyria, Ohio; 6¢/hour, McKesson & Robbins, Bridgeport, Conn.; 6%, General Chemical Div., Allied Chem & Dye, Chicago; 7-12¢/hour, Merck & Co.'s Marine Magnesium Div., San Francisco; and 7¢ across-the-board, Dominion Tar & Chemical, Cornwall, Ont.

• Among newest wage rises for members of District 50, United Mine Workers, are the 10¢/hour general increase at American Cyanamid's Calco Chemical Div. plant in Piney River, Va.; 4%, Solvay Process Div., Allied Chem & Dye, Baton Rouge, La.; 8¢/hour, General Chemical Div., Allied, Marcus Hook, Pa.; and 9¢/hour, Great Lakes Carbon Corp., Lompoc, Calif.

• From a company on the "fringe" of the chemical process industry comes word of one of the more generous contracts of the past year. Ace Rubber Products, Akron, O., is "cutting its employees in" on a new profit-sharing plan, and also offering greater insurance benefits.

LEGAL

Fight on Fluorine: In at least two states, 1954 will be the year of decision in the dispute over legality of adding fluorine to public water supplies as a preventive of tooth decay.

• Oregon's supreme court has agreed to hear arguments in Salem

on an antifluoride taxpayer's suit that had been dismissed by a lower court. The city of Bend has ordered a fluoridation program started, and William J. Baer is seeking a restraining order, contending that no city has the authority to fluoridate.

• Wisconsin's supreme court has refused to step into that state's fluoride fracas out of turn, and has told three antifluoride Milwaukee residents to take their suit to the circuit court first. Milwaukee and 87 other Wisconsin communities now fluoridate their water, but Raymond T. Zillmer, attorney for the petitioners, says that an old state law on food preservatives makes fluoridation illegal.

•

Export Discrepancies: Reports that American-made antibiotics had been seeping through the Iron Curtain and turning up on Korean battlefields prompted an investigation that has led to a U.S. government blow at three German import concerns. The U.S. Bureau of Foreign Commerce says it has banned these three companies from receiving exports from the U.S.: Deutsche Novocillin Bendixen, Funcke & Co., and Chemische Fabrik. The bureau says Deutsche Novocillin illegally transshipped $80,000 worth of U.S. antibiotics, and that intervention by U.S. agents prevented shipment of another $341,000 worth of drugs.

•

Proteus in Reverse: At long last, the trial of the big antitrust case in Chicago is over; but the oratory lingers on. Spectators in Judge Walter La Buy's courtroom just before the holidays won't soon forget the vigorous rhetorical counterattack staged by defense attorneys for Du Pont, General Motors, U.S. Rubber, and 33 members of the Du Pont "family."

• Said John Harlan, leader of the defense lawyers: There was nothing "sinister" about Pierre du Pont's presidency of GM (1920-23); "It was not, as the government tries to insinuate, that Pierre used the time to fill GM with Du Pont stooges."

• Added colleague Hugh B. Cox, in comparing the government's handling of this case to a legend from ancient Greek mythology: Government charges were like Proteus, who could change form when someone laid hands on him, becoming first a fire, then a flood, finally a raging beast. But, "in this case we have Proteus in reverse order—the raging beast has changed to what now looks like a small white rabbit."

Outcome of the case likely won't be known before spring.

FASHIONS FOR INDUSTRY: At left, one-piece denim fitted coat dress; at right, seersucker blouse with denim skirt—pale blue, beige, navy or raspberry.

Something for the Girls

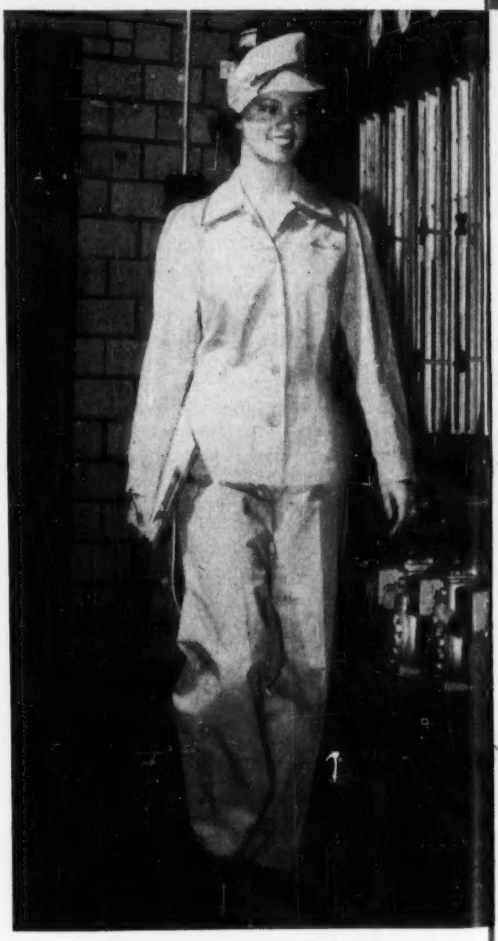
Is glamor out of place in chemical and pharmaceutical plants? Certainly not, say plant managers queried in a CW survey; the trimmer, more shapely uniforms now being made for women plant and laboratory employees, they add, are an important plank in the industrial relations platform wherever women are on the payroll.

As of this week, there's no doubt but that management in chemical process plants in convinced that the more sleekly fashioned industrial clothing —a relatively recent development, stemming mostly from "Rosie the Riveter" days of World War II—is an investment in employee morale, low job turnover, high productivity, and in "company spirit."

In addition, for many companies there's a distinct public relations asset in having women plant workers neatly outfitted; frequently, a visitor's impression of a factory (and its products) depends more on the appearance of the people he sees than on the size, speed and intricacy of the machinery.

Eternal Feminine: Heretofore, management has figured that any garment that shields the employee from acids and alkalies would serve. The new policy is based on the principle that a woman has that "eternal feminine" outlook on the job as well as on the dance floor, and that what she wears has a big effect on her work and her attitude.

This is borne out by comments from girls interviewed in chemical, drug and



SLACKS & SHIRT: Looks, feels fine.

DACRON WHITE: Spic, span, and happy.

cosmetic plants by CW correspondents. Some of the girls were unhappy about their uniforms, found them "depressing." Another complained: "This blanket-style (reversible wrap-around) uniform would look the same if I wore it upside down."

Such attitudes might account for part of the difference in men's and women's job stability. In the chemical industry—which employs some 45,000 women in production work—the job turnover rate for women has been running over 32% higher than for men.

Bait for Applicants: But in plants that have switched to uniforms that are reasonably chic, the girls have a different viewpoint. In fact, the personnel director of one specialties plant reports that his company's feminine uniforms are a good "selling point" to girls applying for jobs.

To show how the uniform can affect a woman's outlook toward her job and her company, here's what one girl told a CW interviewer: "I wouldn't like wearing just any old uniform, because they can be very baggy and unattractive. But at Toni, each of us has her own, so we can alter them to fit us."

As illustrated by the accompanying pictures,* plant and laboratory uniforms can be altogether fetching. At one plant, CW found the girls wearing blue and white sport-style dresses that were so attractive the girls also wore them on dates. Cotton is the most frequently used material, although some companies are finding that nylon and other synthetics give longer wear.

At first glance, the whole subject of stylish uniforms for plant workers may seem a bit frivolous; but it's another logical step in sound industrial relations—based on a more realistic appraisal of the human factors involved.

* Including outfits designed for chemical and pharmaceutical jobs by Angelica Uniform Co., White Swan Uniforms, and Eleanor Lambert, Inc.

WHITE COTTON BUTTON-DOWNS: Make lab work glamorous—to onlookers.

One More Roadblock

The determined bid of Harvey Machine Co. to crack into production of basic aluminum hit another snag last week when fishing interests registered a protest with the Federal Power Commission against the granting of a preliminary permit to allow Harvey to investigate a dam site on the Copper River, near Cordova, Alaska. At latest count, Harvey officials, almost completely inured to government reversals of policy, wouldn't comment except to say that they're still investigating plans to erect an aluminum reduction plant at either Cordova or Valdez—"and obviously a dam is needed in either case for necessary power generation."

Right from the start, Harvey's struggle to break the hold of the "Big Three" on basic aluminum production has met with stumbling blocks. In Sept. '51,—with Defense Production Administration certificates of necessity issued and government purchase contracts wrapped up—the Interior Dept. (officially crying Northwest power shortage warnings) stymied construction by asking DPA to withdraw its loan approval. Next to slip away: Harvey's Kalispell, Mont., project—a $46-million affair—which the Justice Dept. persuaded company officials to transfer to Anaconda Copper Co., a more wealthy partner, able to raise the necessary cash requirements.

Then, early last February, Leo M. Harvey, president, sailed into contention again with plans to spend roughly $65.6 million for facilities at Dalles, Ore., designed to turn out 54,000 short tons of aluminum yearly. Proof of his intention: a certificate of necessity written out for $65,250,000 at 85%—broken down into $35 million for a primary reduction plant, $10 million for development of bauxite supplies, $20,250,000 for construction of an alumina plant. Initial estimates called for aluminum production by mid-1954, but "until the government comes through with its contractual obligations," said Harvey last week, "the company can't meet its schedule." Power's again the official monkey-wrench in the machinery—but you can't convince harried Harvey officials that that's all that's behind the delay.

Meanwhile, negotiations to purchase a $325,000 governmental war surplus plant at Salem, Ore., drag on. Booked as an alumina-from-clay experimental station, the unit's slated (with alterations) to serve as Harvey's alumina plant—provided possession becomes official. Right now, although already in the plant, the Har-

THE *Tin*
IN *Tintinnabulation*

To the Chinese, who first alloyed tin and copper to cast bronze bells, the charming new sound was easily worth "more than ten thousand words."

Later, in Italy, the Campanilismo – from "Campanile bell"– came to be the only meaningful way of designating territorial units. So symbolic was it in the local life that a strong bond grew among all within hearing range of any Campanile bell.

But the distinct personalities that Edgar Allen Poe found in bell tones were inherited from the British, who developed bell making into an art. They learned to cast bells to exact dimensions and to use alloys which would give varied tones; chimes became part of the island's charm.

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B&I . . . . . .

vey staff says the purchase hasn't been formalized, though from its own viewpoint the bill has been paid in full. Under final terms, Harvey agrees to continue experiments on Oregon clays, but reserves to itself the decision as to their nature, extent and duration. (The government had originally held out for periodic inspection of developments.)

The whole idea, admittedly, says Leo Harvey, is to make economically feasible the use of domestic clay as a source of alumina. If that can be done (and company officials hint that the basic theory of production has already been proved), Harvey Aluminum will at last have a firm foot in basic aluminum production.

It's apparent that Alcoa thinks there's better than an outside chance that Harvey's scheme may pay off; it, too, has staked $2 million in bauxite mining claims in the Northwest. Best estimates claim that 80% of the cost of is transportation charges. With alumina right on its doorstep, Harvey could well offer more than a little competition to its competitors–once power and community protests, such as this latest fishermen's wail, are erased.

FOREIGN . . . . .

Sulfur/Iraq: The Iraqi government and the Texas Gulf Sulphur Co., are expected to seal an agreement soon to develop Iraq's sulfur resources on a basis of equal profit sharing. The 50-year pact would:

- Make Iraq a full partner in the venture.
- Give Texas Gulf rights to explore and exploit sulfur resources in the 33rd-parallel region.
- Require Texas Gulf to return to the government 25% of the region every five years–retaining after 20 years 1,000 kilometers for mining purposes.

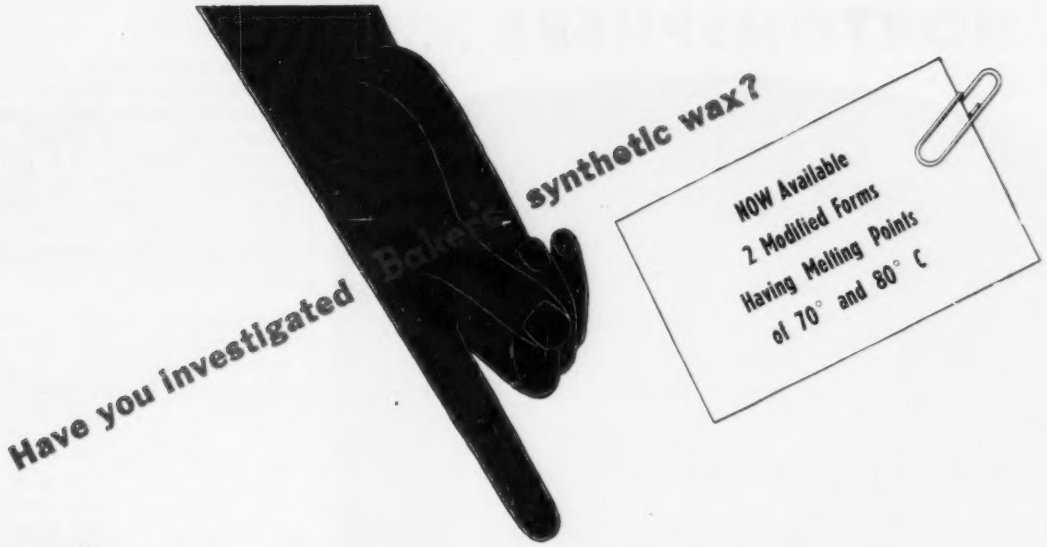
Subject to approval by Parliament, the company expects to begin operations next year, will pay Iraq's share of the profits in dollars.

•

Sulfur/Mexico: The American-owned Mexican Sulphur Co. has started large-scale operations in San Cristobal, Mexico, say company officials. The $6-million plant's annual sulfur output is expected to exceed 200,000 tons/year, more than enough to cover Mexico's needs.

•

Pulp/Alaska: Japanese interests have incorporated the Alaska Lumber & Pulp Co., plan to establish a pulp mill at Sitka, but their intention "of buying land leases in Alaska and acquir-



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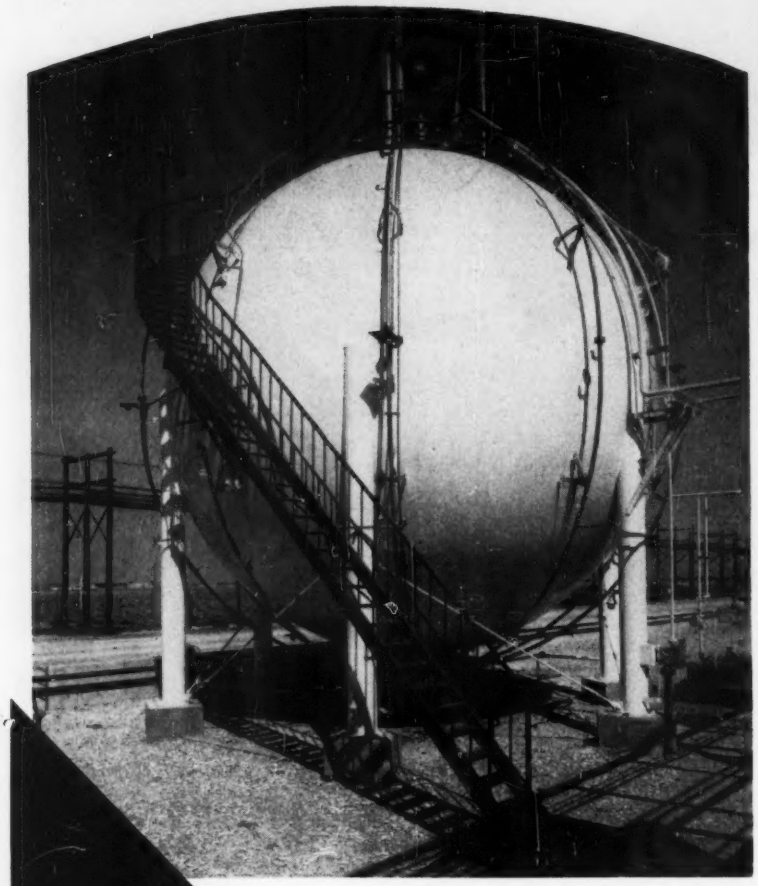
HORTONSPHERE . . .



stores Butadiene

The 2500-bbl. Hortonsphere shown in the above illustration is used to store butadiene at a large chemical plant in the Gulf Coast area. The butadiene is recovered at the plant and used in the manufacture of synthetic latices.

During the erection of this structure, the Chicago Bridge & Iron Company Field Welding Supervisory Service provided a welding expert to assist the Foreman in charge of the job in checking welds, supervising the cutting and grading of plugs, and to check welding equipment and welding techniques. He also helps the Foreman magnaflux, x-ray or stress-relieve welded joints if called for in the specifications. Field Welding Supervisory Service is a standard procedure on all Chicago Bridge & Iron Company welded structures . . . *at no extra cost to you!*

Take advantage of this service! Write our nearest office for quotations the next time you need pressure storage vessels, corrosion-resistant storage tanks, elevated water tanks or special welded steel plate work. There is no obligation on your part.

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Birmingham 1	1575 North Fiftieth St.	New York 6	3361—165 Broadway Bldg.
Boston 10	1070—210 Devonshire St.	Philadelphia 3	1670—1700 Walnut St. Bldg.
Chicago 4	2173 McCormick Bldg.	Pittsburgh 19	3271 Alcoa Bldg.
Cleveland 15	2261 Midland Bldg.	Salt Lake City 4	1271—573 West 17th South St.
Detroit 26	1572 Lafayette Bldg.	San Francisco 4	1373—200 Bush St.
Havana	402 Abreu Bldg.	Seattle 1	1672 Henry Bldg.
Houston 2	2169 C & I Life Bldg.	Tulsa 3	1165 Hunt Bldg.

Plants in: BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

B&I. . . . . .

ing the timber on the land" puzzles the Pacific Northwest timber industry. Seattle lumbermen bluntly point out: "There isn't enough privately owned timber in Alaska to put in your eye;" since virtually all timber is government reserve. Alaska Lumber officials in Tokyo, however, stolidly maintain that the company expects to begin construction of its mill in 1955.

•

Petrochemicals/Australia: Discovery of commercial quantities of oil in Australia it's learned this week will spur plans to build foundations for a major petrochemical industry within the next 12 months. Australia's first company in the field, the newly established Petroleum & Chemical Corp., Ltd., will receive designs, machinery, and technical know-how from the Gas Machinery Co., Cleveland, O., plans to concentrate first on production of crude benzene, toluene and xylene. Other preliminary surveys and negotiations are reported currently under way, heralding formation of other companies soon. Further: a number of large U.S. companies are showing interest in the field as a potential market for American-made equipment.

KEY CHANGES. .

N. H. Collisson and **M. F. Meissner,** to vice-president for operations, Olin Industries, Inc., East Alton, Ill.

Frederick M. Meigs, to assistant general manager of foreign operations, General Aniline & Film Corp., New York.

R. A. Richards, to manager, Bonding Materials Div., Bakelite Co., Union Carbide and Carbon Corp., New York.

William R. Ludka, to director of staff laboratories, Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Howard E. Elden, vice-president in charge of manufacturing, research and development, Dunlop Tire and Rubber Corp., Buffalo, N.Y.

Al Taragowski, to production manager, Humphrey-Wilkinson, Inc., North Haven, Conn.

S. R. Stovel, to general assistant to the vice-president, North American Cyanamid, Ltd., Toronto, Canada.

KUDOS . . . . . .

Chalmer G. Kirkbride, president and director, Houdry Process Corp., elected president, American Institute of Chemical Engineers, for 1954.

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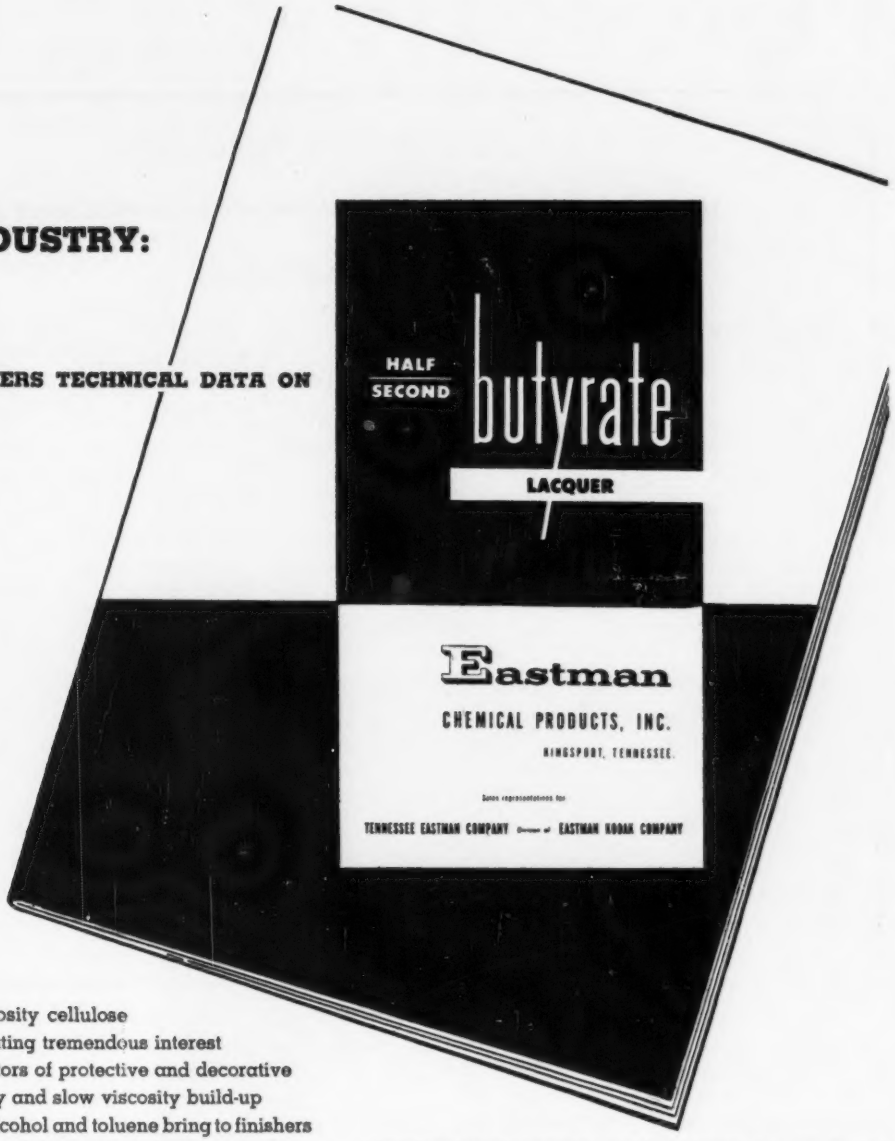

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Chemical Plant Vulnerability

(Damage expected to result from atomic bomb exploding above ground)

Type of Structure	—Distance From Explosion— One Mile	Two Miles	Three Miles
Reinforced concrete buildings	Building standing, walls and partitions destroyed	Severe damage, must be vacated for repair	Partial damage, need not be vacated for repair
Wood buildings	Virtually destroyed	Severe damage	Partial damage
Power plants	Building severely damaged, equipment repairable	Building severely damaged, equipment slightly damaged	Building partly damaged, equipment slightly damaged
Above-ground storage tanks	Ruptured and destroyed	Ruptured, partly destroyed	Damaged, not ruptured
Fractionating columns	Partly destroyed, extensive repair needed	Damaged, minor repairs required	No damage except to outside piping
Still reactors, kilns, dryers	Virtually destroyed	Practically destroyed, major repairs needed	Partly damaged, minor repairs needed
Elevated water tanks	Destroyed or damaged beyond use	Tanks supported by frames may fall	Partly damaged, not ruptured
Piping outside buildings	Total destruction	Total destruction	Partly damaged
Inside piping	Virtual destruction	Numerous breaks	Probably no breaks
Underground water and gas mains	Some breaks, especially on bridges	No damage except on bridges	No damage

Prepare for the Worst

What must industry do to prepare for atomic attack? This question, asked by the Office of Defense Mobilization of the industry groups represented in the Korea-born National Production Authority, received its first answer—from a chemical task group.

Last fortnight, (*CW, Dec. 26*) the Chemical and Rubber Division of the Business & Defense Services Administration, successor to NPA's Chemical Division, took the wraps off its 60-page summation of what top executives and production men must do to assure continued operation following such disasters as an atomic attack.

Now or Never: Emphasizing that survival depends on "how ready we are when the attack comes—not how ready we can be in a few days or months," the group outlined specific steps that should be taken on companywide and on single plant levels.

The task force feels that the chemical industry is well suited to cope with disasters, because of its day-to-day dealings with hazardous products.

Thus the problem, in the authors' eyes, is how to extend the procedures and techniques now used to protect personnel and property to cover such disasters as would follow an atomic attack.

Plans for plant protection should, they feel, be determined by the plant's own bosses, and not at higher levels. A plant manager should set up a disaster study group, comprising production, engineering, power, maintenance, medical, safety and fire protection representatives.

This group should: (1) review and analyze existing physical hazards—looking at plant processes, materials, equipment, storage and handling for such hazards, (2) check inspection and maintenance schedules to keep tabs on housekeeping, fire protection, equipment, pressure-relief devices, dependability of instrumentation, electrical grounding, conditions of bulk storage facilities, fume and dust control, exit facilities, personal protective equipment and first-aid supply, (3) review emergency shutdown—"hold safe"—procedures, with the thought that saving the product is secondary to protection of employees and equipment.

The same group should also check plant procedure in prevention and control of sabotage. This would include screening to keep security risks out of plants, setting up a fingerprinting system to aid in tracking those who already may be working, making sure that physical measures like fencing, plant lighting, and electric detection systems are adequate.

A final task of this disaster study group should be to coordinate plans with the community. A good mutual aid organization is an important part of any disaster plan.

Looking Ahead: Once the study group has completed its work, it would create an organization to obtain the results outlined.

These are the key members of such an organization:

• Disaster Officer. He, as coordinator of all activities, is responsible for keeping superiors informed of planning. He should establish the detailed disaster plan, oversee training programs, keep a record of such programs, plan frequent conferences of disaster plan personnel and work closely with nearby facilities and community groups.

When disaster strikes, he should move to his pre-arranged center of operations, contact members of the disaster team, brief them if time allows, contact local, state and federal officials, prepare to notify families of casualties, and give the public details of the disaster to reduce chance of panic and to prevent rumors.

When disaster is past, he should gather reports from the disaster team, appraise total damage and report to superiors, telling them what is being done towards recovery. He should also report to local, state or federal groups, remembering the part that plant production plays in national defense.

• Communications Officer. He must devise alarms that won't be confused with other general plant signals or with signals from nearby plants; plan with local police a road block system to keep highways open to and from the plant; supply local police, fire, hospital and first-aid groups with plant maps; augment ordinary means of communication with messengers and walkie-talkie radio; coordinate his work with other groups.

In time of emergency, he sounds the warning signals when told to do so by the disaster officer; disperses his team to strategic locations to serve as relay points for central control; cuts off all personal phone calls; tells police to set pre-arranged roadblocks; notifies ambulances, hospitals and fire-fighting agencies; notifies key members of plant organization who are out of the plant.

After the disaster, he should check damage to areas he controls, report to disaster officer and stand by to assist recovery operations.

• Fire Chief. He must train fire fighters and rescue squads, be sure that equipment is maintained and inspected, plan for auxiliary water supplies, be ready to direct any fire-fighting services coming to his aid.

When an emergency occurs, he should take charge of fire-fighting and rescue, direct placing of equipment, be alert against fire spreading to combustible materials, coordinate with others.

Afterwards, he should determine cause of fire, report to disaster officer to prevent recurrence of situation, restore fire-fighting facilities to full strength as soon as possible.

• Guard Chief. He must organize, train and equip a guard force, arrange to direct flow of traffic during emergency, establish free lanes of access to and from plant, plan to protect outlying equipment during emergency, oversee plant evacuation, plan for protecting valuable records and specialized equipment, plan to protect against sabotage.

• First-Aid Chief. He should train emergency first-aid workers, keep liaison with civil defense agencies and with the Red Cross, check location and adequacy of first-aid supplies, select sheltered areas for aid stations, coordinate with others.

• Engineering Chief. He should set up a plan to shut down utilities that's consistent with the production department's emergency procedures; oversee the listing of detailed instructions for the shutdown of every process; have portable lighting units, pumping equipment, etc., ready; prepare for repair and demolition services and for decontamination of structures and materials.

Keeping Posted: More important, though, than setting up these duties is the actual follow through. Once plans are set, dry-runs should be carried out repeatedly to perfect the procedures.

Planning and training should be kept current as new knowledge of conditions that might be faced is received.

FUMES from ball mills are exhausted before maintenance workers enter.

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Getting rid of fumes, dust or toxic vapors that regularly occur in the plant may be expensive, but it normally doesn't prove to be much of a problem otherwise. Pittsburgh Coke and Chemical, however, in its Neville Island (Pa.) plant didn't encounter them continuously—or even at a regular interval. Instead, it had what the weatherman might describe as "intermittent fumes"—numerous places where it might need ventilating equipment for a few hours at a stretch.

The solution, as worked up by Safety Supervisor James Padoveses and his associates, turned out to be a

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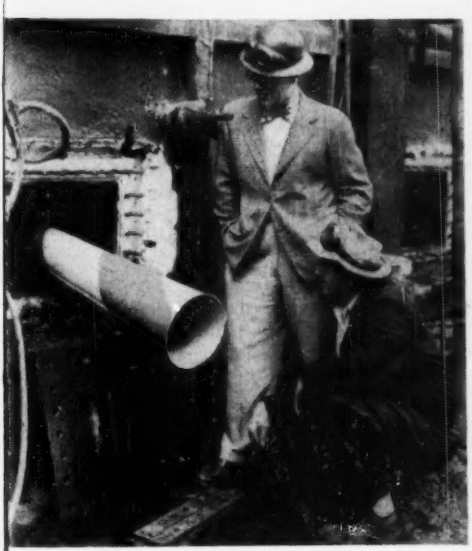

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Making it Easy for the Queasy

It looks like competition ahead in motion sickness remedies. The boom in low-cost travel is making a market that's luring more chemical companies.

New medicine, acting similarly to Dramamine, has hit the stores—claimed to offer a longer effective period. Latest product in a briefly researched field, it could make a real fight with Mothersill's and Dramamine.

Somewhat overshadowed by the monuments to the half-century advances in transportation facilities is a valuable contribution to pleasanter travel—motion sickness remedies. These medicines, the scientific sequels to such ingenious cures as icebags on the spine, have played a vital role in selling "travel" to Americans.

Now, old stand-bys like Mothersill's, Dramamine and hyoscine-based remedies are in for new competition. Chas. Pfizer & Co. is broadening its pharmaceutical interests by offering a European-developed product called Bonamine (*CW, Dec.* 5).

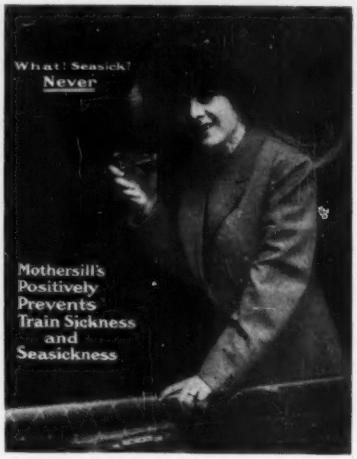
To some, Mothersill's* is merely a name that's sparked thousands of jokes. Yet, in spite of jokes, two generations of travelers have gulped down some quarter billion of these little pink-and-brown capsules.

But travelers haven't always gulped them from choice—until World War II there was little else to be had. Then the war brought a change. Amphibious operations and the unprecedented use of planes made motion sickness a military problem. It spurred research on the subject—research that has continued with profitable results.

Out of it has come Dramamine, a product of G. D. Searle & Co. Though marketed for less than five years, the company claims Dramamine has already grabbed the "lion's share," is reluctant, however, to show its dollar figures. Now Dramamine's position is being challenged by Bonamine.

It wasn't until 1881, when an English physician coined the term, that medicine recognized that vehicles other than ships caused motion sickness. In the meantime, train-, car- and air-sickness have become all too familiar. Studies reveal that really rough travel will make 9 out of 10 people ill, while moderately turbulent motion upsets from 10 to 30% of inexperienced travelers.

All in the Head: One of the few facts about motion sickness established before the 1939-45 war period was that individuals suffering from deafness due to damage to the nerves of the inner ear are, for the most part, immune to it. That suggested, and wartime research confirmed, that the organ of balance, the body of the inner ear, is involved, rather than the stomach.



MOTHERSILL'S: A remedy more than just a memory.

Among the long list of compounds tested for prophylactic effect, only one was found to have useful antimotion properties. This was hyoscine or scopolamine, a derivative of the belladonna plant, and well-known as a sedative. Its virtue lies in the fact that it depresses the nerve centers in the brain so that sensations that would normally give rise to vomiting are suppressed; plus that, it has a dampening effect on nerve impulses coming from the inner ear.

It's credited with helping many Allied troops across the English Channel to Normandy who otherwise would have been too seasick to care whether the Germans were there or not.

But scopolamine has one big drawback: side effects bar taking it for any length of time. After the war, interest in finding something better seemed to slacken. Then one of those lucky medical accidents happened. The accident concerned Searle-developed Dramamine (β-dimethylamino-ethylbenzohydryl ether 8-chlorotheophyllinate).

When it was being tested for antihistaminic properties, one of the human "guinea pigs" made a discovery. Usually when she rode in a streetcar she became nauseated. But she found that whenever she took Dramamine a few moments before boarding one, the usual symptoms of motion sickness failed to appear.

That was in 1949. Today Dramamine is used by all branches of the military services, by most airlines and shiplines. In the words of its maker, "Dramamine has become a virtual household term for a motion sickness preventative."

While Dramamine is not sold in drug stores without a prescription, it is given tactfully by plane hostesses who have been instructed on its use by airline medical directors. In addition, it is employed for "morning sickness" of pregnancy, and nausea caused by anesthesia, radiation and electroshock therapy as well as in the administration of specific drugs and narcotics. On the negative side: it must be taken every few hours.

Challenger: The big challenger of Dramamine is Pfizer's recent, Belgian-researched Bonamine (1-*p*-chlorobenzhydryl-4-*m*-methylbenzylpiperazine dihydrochloride). Pfizer hails it as "the first compound effective against motion sickness—in a single daily dose." Promotion literature asset: "With just 4 tablets of new Bonamine you can fly from Boston to Bangkok (a 2-day trip) with new freedom from airsickness."

While Bonamine has done well in tests conducted by the U.S. Army, Navy and Air Force—tests that have backed up the company's claims—it will have a hard fight ousting Dramamine. Already Pfizer has found that airlines are "conservative," that they aren't in any hurry to toss aside something with a good reputation. Like Dramamine, Pfizer's product is an ethical drug.

Another preventative is Parke, Davis & Co.'s combination of hyoscine and Benadryl (diphenhydramine hydrochloride, which is an antihistamine). On sale for more than a year now, its maker says it is more effective than hyoscine alone. Still another is nine-month-old Trevs, the tradename for a hyoscine-based compound that

* In the U.S., Mothersill's is manufactured by Strong, Cobb & Co., distributed by Ferd. T. Hopkins & Son. It is made mainly, however, in Canada by Parke, Davis Co. Ltd.

also contains caffeine and aspirin, according to its manufacturer, M. A. Wright Co., of Brooklyn, N.Y. The first of these is ethical, the second isn't.

Mothersill's Story: But it would be hard to discuss motion sickness remedies without relating the story of Mothersill's. Its discoverer was Dr. Claude Fortin, a Canadian, who in 1906 helped form a company to manufacture the product.

One of the shareholders and directors of this company was a drug salesman named Thomas Barton Mothersill. Because he was widely known in the Canadian drug trade, it was decided that he should give his name to the compound. Accordingly, in 1907 the company was dubbed the Mothersill Remedy Co.

Since then, Mothersill's has seen many competitive products come and go. There are good reasons why Mothersill's has held on to sales. One is its pleasant-sounding name. But more important is the fact that the main ingredient in its original formula was hyoscine. (Because its inventor hit on the formula in 1903, that makes science trail by about 35 years.)

Also, credit must be given to two drug tycoons, an American and a Canadian, who entered the story of Mothersill's in 1925. That year Ferdinand T. Hopkins, of New York, and James G. Stenhouse, of Montreal, bought out the original shareholders—with the exception of one share, which is still waiting to be claimed.

Under their guidance, Mothersill's has invaded nearly every country in the world—it even makes its way behind the Iron Curtain. Today the company puts out Mothersill's Seasick Remedy (three doses for 75¢) and a three-dose package of Mothersill's Airsick Remedy (also 75¢). The only difference between the two is that the airsick product works faster.

Capsule Report: Each year more than 7 million capsules are sold on a money-back guarantee. The company reports that refunds in the United States amount to around $30/year. And there are letters. About 100 a week pour in from Mothersill users from Kurdistan to Siam. Most are addressed to "Mothersill's, Canada," some to Mrs. Mothersill. One wag has said that its users take comfort in the belief that "mother can do no wrong."

As for what the future holds, partner Hopkins isn't worried. He says, "Sales show a healthy increase each year. . . . Mothersill's has a free sale over the druggist's counter—no prescription is required—something that few competitive articles enjoy."

All of which indicates a confidence that despite Dramamine, Bonamine, or whatever researchers come up with, no one is going to find it easy to pull the carpet from beneath Mothersill's Travel Remedies for a good long time.

Nevertheless, faster, lower-cost travel is putting more and more people on the move. It's creating a market that pharmaceutical firms will study with an eye toward profit—chances are competition is just beginning.

Better Liked

With a parental interest in pressure-packed products, Du Pont regularly keeps tabs on how various aerosol products are going over with the public. Just recently it released its newest study of consumer buying and reaction.

This survey, the third on consumer likes and dislikes, was based on a questionnaire sent to some 3,000 families, and returned by 2,599 of them. There were questions about aerosols in general, and detailed inquiries on seven products (insecticides, room deodorants, paints, Christmas snows, personal deodorants, hair lacquers, and shaving creams). Among the data gleaned:

- By now, most families have tried at least one aerosol product or another. Of the families questioned 87% have sampled the push-button products at one time or another. Survey brought out that the higher the family income, the more likely the family had tried an aerosol.
- Generally speaking, consumer satisfaction is high (70%); dissatisfaction low (2%). Insecticides are generally the most pleasing product (81% of users were satisfied), followed by room deodorants (71%), and hair lacquers (66%). Personal deodorants trailed the list (41%). Defects in the valve or container seemed to cause most complaints, but cost, effectiveness, etc., was higher in individual cases.
- When stacked up against other forms of the same sort of product, the aerosols did well. They were top choice (among people who used them at all) in the case of insecticides, hair lacquers, and room deodorants. Personal deodorants stood number two.

Can Can't Help: Prime selling point of aerosols, since their introduction, has been convenience. It's interesting to note, however, that the novelty of pressure packaging won't produce a satisfied customer if the basic formulation isn't good. With foam shave users, for example, the major portion of those dissatisfied thought the aerosol gave a poor shave, or didn't soften the beard, or gave poor lather. Among hair lacquer "malcontents," stiff, unnatural hair was a prime objection to the use of the product. With personal deodorant users, top objection was that the product was "ineffective" or had a disliked odor.

The survey, which Du Pont alternates with its dealer survey, should give aerosolers plenty to think about. The high degree of satisfaction is comforting, but the reasons for dissatisfaction ought to be of more real advantage to them.

Carnauba on the Couch

Depression, feelings of insecurity, and general unhappiness mark Brazil's carnauba wax industry. For a little help in building up confidence—more precisely, markets—the Brazilian government is calling on an American chemical engineer.

Charles Marsel, associate professor of chemical engineering at New York University, and co-author of CW's recent report on waxes, has been chosen. He left in mid-December to discuss ways of reducing the cost of carnauba wax extraction without lowering the quality of the product.

Carnauba accounts for 5% of Brazil's total exports, and at $1-plus prices, it's being by-passed for cheaper substitutes in a number of products. Brazilian concern about the price situation was made abundantly clear last November, when Finance Minister Aranha charged that four or five U.S. firms virtually control wax prices.

Marsel's basic approach to the problem, he indicated before he left, will be to further mechanize the wax processing techniques. He hopes that higher quality (purity) wax can be produced, and at the lower prices necessary to promote high consumption.

•

Doubled: The Butler, Ind., fertilizer plant of Federal Chemical Co. (Louisville, Ky.) is being doubled in size.

•

Twice Sold Tale: Lady Esther Ltd., Chicago cosmetics firm, recently changed hands two times in 18 days. The concern was sold by Chesapeake Industries, Inc., New York City holding company, for $3,275,000 to the estate of Alfred H. Busiel, its founder, then to Lansing Foundation Inc., a charitable organization.

•

Free-flowing Form: DPR, Inc., a subsidiary of H. V. Hardman Co., (Belleville, N.J.) is marketing a synthetic

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Lucky Bones

WISHBONES, ingenuity, and chemicals have been turned into tidy profits by a New York businesswoman, Anne Harrison. She cleans the chicken bones by soaking them in trisodium phosphate solution, paints them in gay colors, then attaches them to cards reading, for example, "Wishing You a Happy New Year."

Miss Harrison started her business last August, selling to department stores. Already business is booming; she processes over 1,000 wishbones a day. Supply's no problem—she gets the wishbones from a New York restaurant chain.

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Odor	Characteristic and free from foreign odors
Color, APHA† max.	5
Acidity, as acetic, % by wt. max.	0.003
Alkalinity, as NH_3 % by wt. max.	0.003
Permanganate Time, min.	30 minutes
Acetone content, % max.	0.01
Hydrocarbons	None
Non-volatile material, % max.	.001
Sulfuric acid wash test	Not darker

†American Public Health Association Standard .000125N. iodine solution

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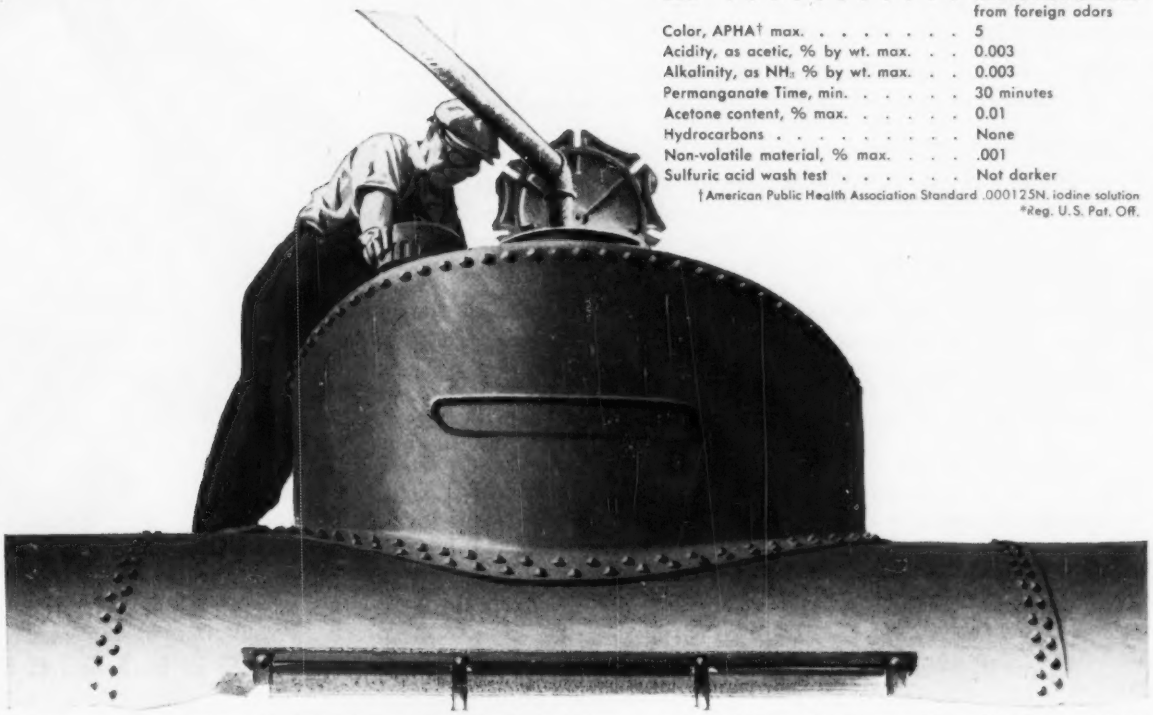

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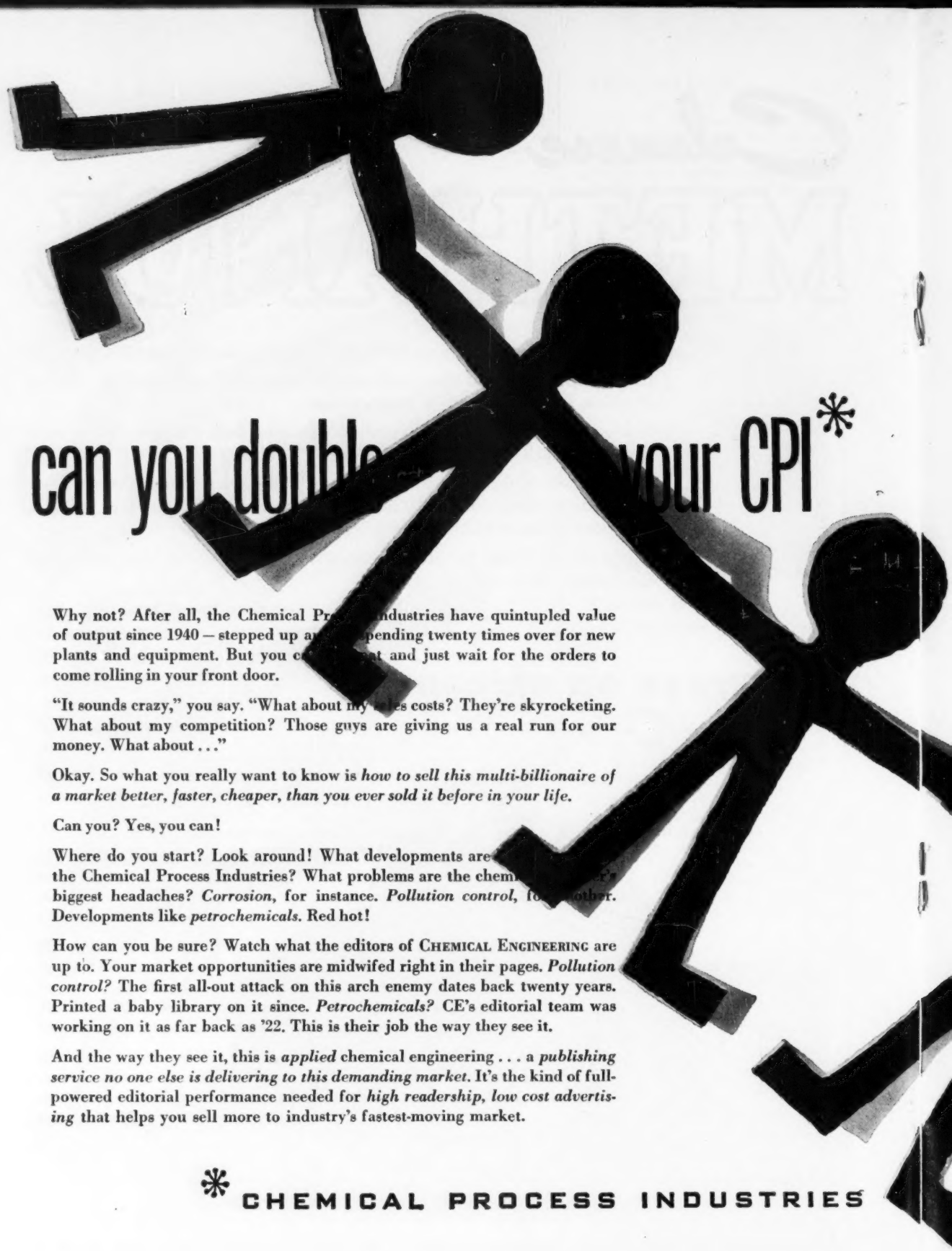

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Trying a New Approach

Union Carbide and Carbon Corp. late last month revealed that it is farming a significant program of research to European Research Associates, S.A., of Brussels.

The overseas organization will carry on a broad program of fundamental investigations in chemistry, physics and metallurgy for its American client.

If Carbide merely wanted to step up its basic research effort, it could have accomplished its purpose without trekking more than 3,000 miles. Behind the move is a less obvious, but no less important aim: to broaden the scope of the company's scientific activities, reap the benefits of a different approach to research.

There's another angle, too. Aside from laboratory studies in Carbide's

CARBIDE'S McNAMEE: Full understanding won't be a problem.

behalf, ERA—by means of a string of fellowships and consultantships throughout Europe—will have its ear to the ground for rumblings of industrially significant developments in other quarters. And, by the look of things, it has its work cut out in keeping track of Western Europe's technological resurgence.

By hiring a native organization, rather than setting up its own European group, Carbide acquires a ready-made "in" with Continental scientists; more important it takes no chances of being labeled an intruder, cannot be misaccused of an attempt to milk the Europeans.

Fair Trial: Just how much work the company has farmed out is anyone's guess. Raymond McNamee, manager of UCC research administration, says only that it is a "significant" amount. That, of course, covers a lot of territory in a research program the size of Carbide's. Payment, according to McNamee, will be on a contractual basis. He gives no hint of how long the contract will run, reports that in any case the arrangement will be given a fair trial.

It isn't difficult to visualize some of the problems of long-distance research sponsorship. One headache McNamee will most certainly be spared is the problem of making himself fully understood. Director of European Research Associates is not only an American, but also a former Carbide man. He's Roger Gillette, was for seven years in the employ of Linde Air Products Div.

Gillette took the reins of ERA after completing a year-long scientific assignment in Europe for the U.S. government.

The Plunge: There is no apparent corporate link between Carbide and ERA. The latter was organized early last year in Belgium by a group interested in getting into the consulting business. Carbide got a line on the undertaking from the staff that "cases" Europe for the company. Finding the water to its liking, Carbide took the plunge.

ERA has just finished building, will launch its American client's fundamental probe in spanking-new laboratories.

Significant in its own right, the Carbide intercontinental research deal could foreshadow a surge of foreign research activity by American firms. It's no secret, (*CW, Nov. 8, '52*) that several European countries offer some appealing scientific inducements. It may be more than coincidence that a bevy of U.S. firms now have observers in Europe.

Toxicant Trials

Chlorinated organic insecticides are spotlighted this week by the results of research in widely separated quarters.

• British researchers Bradbury, Nield and Newman of Imperial Chemical Industries set about to discover how the housefly develops resistance to benzene hexachloride (BHC). Specifically, they were trying to determine whether resistance resulted from the insecticide's inability to penetrate the tissues of certain fortunate flies.

Although the ICI team still cannot explain the resistance mechanism, it can report that resistance is not due to difficulty of penetration.

Here's how that conclusion was reached. BHC-resistant flies—able to tolerate 0.5% gamma-BHC in their food—were exposed to radioactive doses of insecticide for periods ranging from 15 minutes to 16 hours. Amount of BHC picked up was determined in each case by two procedures.

An "outside" fraction was obtained by a carbon tetrachloride rinse. The "inside" portion, from internal insect tissues, was removed by grinding the rinsed insects with anhydrous sodium sulfate, extracting them with carbon tetrachloride. Both fractions were determined by combustion to carbon dioxide, isolation of the latter as barium carbonate.

"It is clear," the ICI researchers conclude from the data, "that in the first two hours, resistant flies picked up less carbon-14-labeled benzene hexachloride than normal flies, both 'outside' and 'inside.'" The difference, however, is offset for practical purposes by the finding that resistant flies—even before exposure to the insecticide—contain BHC transmitted from earlier metamorphic stages.

Pieced into the framework of experimental data, the BHC carry-over evidence makes a detoxification process unlikely in resistant flies. "These," report Bradbury and Nield in *Nature*, "carry over . . . from the larval stage enough insecticide to kill normal flies in a few minutes."

• Not limiting themselves to one toxicant, USDA Bureau of Entomology and Plant Quarantine staffers Fleming and Maines probed the effect of a number of chlorinated organics on plants grown in soil containing the synthetics. The work was part of a continuing program of Japanese beetle control investigations.

The USDA duo planted a wide variety of vegetables in soil pots treated with six chlorinated toxicants: aldrin, dieldrin, endrin, isodrin, lindane and heptachlor. Watering techniques, pot arrangement, etc., were carefully controlled to keep environmental variations to a minimum.

Briefly, results indicate that certain sensitive crops may be injured by the amount of chlorinated organics needed to kill Japanese beetle larvae

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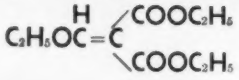
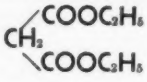


▶ DIETHYL MALONATE*



▶ PHENYLACETIC ACID* $C_6H_5CH_2COOH$
▶ DICHLOROACETIC ACID $Cl_2CHCOOH$
▶ CYANOACETIC ACID* $CNCH_2COOH$
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in the soil. Spinach and potatoes, for example, appear to be very sensitive to aldrin; soybeans, corn, eggplant, peppers and tomatoes were found to be sensitive to lindane.

On the whole, however, the experimental group received a relatively clean bill of health. Researchers Fleming and Maines conclude: ". . . With the possible exception of lindane, these insecticides might be used at the recommended rates without causing serious damage to most of the crops tested."

•

Over the Hump: Latest estimates prepared by National Science Foundation show a marked drop in federal research obligations and expenditures for fiscal 1954. Here's how the new figures shape up: total obligations for this year stand at $2.07 billion compared with $2.18 billion in 1953; expenditures are pegged at $2.18 billion in 1954 compared with $2.20 billion in 1953. And since the lag between obligation and expenditure has averaged about nine months over the past several years, the decline in obligations for 1954 will in all probability be reflected in a further downswing in 1955 expenditures. As expected, Dept. of Defense continues as top federal research spender. Current data indicates that in fiscal 1954 the department may obligate $1.55 billion, including a $142-million carry-over from previous budgets.

•

Dual Purpose: Nuclear-substituted polystyrenes have yielded chelate ion exchange resins to researcher H. P. Gregor of Polytechnic Institute of Brooklyn (N. Y.). With the new experimental resins, it may be possible to simultaneously chelate metals, absorb ions.

•

Hypertension Hopefuls: Georgetown University's E. Emmett Reid and coresearchers at the school's Washington, D. C., medical center report the discovery of a promising new brood of blood pressure reducers. They're hydrogenated dialkylaminoalkyl isoindoles, prepared by the reduction of appropriate dialkylaminoalkyl imides. Physiological tests showed the isoindoles to possess only weak hypotensive action; but their dimethyl quaternary salts exhibit very potent pressure cutting activity, low toxicity.

•

Analysis Aid: A new procedure developed at National Bureau of Standards is beamed for the cellulose consuming and processing industries. It's a method for pinpointing cellulose degradation by determining glucose aldehyde

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groups. Novel feature: the NBS technique, based on acid sodium chlorite, gets around the conventional alkaline methods, which often are unsuitable for application to modified celluloses.

•

New High: Armour Research Foundation (Chicago) has just closed out a record-making year. Volume of research soared to $10 million, 25% over the 1952 figure; physical plant was expanded to 260,000 sq. ft. by occupancy of two remodeled buildings; and staff was augmented by 150 researchers.

• Latest product of Armour research is a nuclear spectrometer, which, Armour says, enables foundation scientists "to detect and measure materials in amounts [e.g., down to one part per billion, in some cases] far below the limits of other methods."

•

Eyeing a Surplus: Spurred by the mounting surplus* of fats and oils, Association of American Soap and Glycerine Producers has set up a new research fellowship at the Dept. of Agriculture's Eastern Regional Research Laboratory (Philadelphia, Pa.). Aim: to broaden the industrial application of fatty acids, find new markets for fats and oils.

•

Package and All: An imaginative approach to detergent packaging is now under scrutiny in Du Pont's Electrochemicals Dept. laboratories. Du Pont researchers are working with a film of polyvinyl alcohol, which would cut out two washday motions: measuring out detergent, throwing away an empty box. Here's how: detergent, package and all, could be thrown into the washer. Water-soluble vinyl film would go down the drain with the wash water.

•

Paper Prospect: Paper products from sugar cane bagasse is getting to be more than just wishful thinking on the part of Hawaiian Sugar Planters' Assn. HSPA reports that research by Crown-Zellerbach Corp. indicates that the technical problems of bagasse pulping can be solved. Two-thirds of the association's by-products research expenditure for 1953 was sunk into the paper-from-bagasse problem.

•

Saving the Rinse: Here's an added argument for automatic lab glassware washers. According to Chemical Rubber Co., its new machine makes it un-

* Surplus animal fats totaled 700 million lbs. in 1952

Illustration courtesy of
The Murray Corp., Detroit

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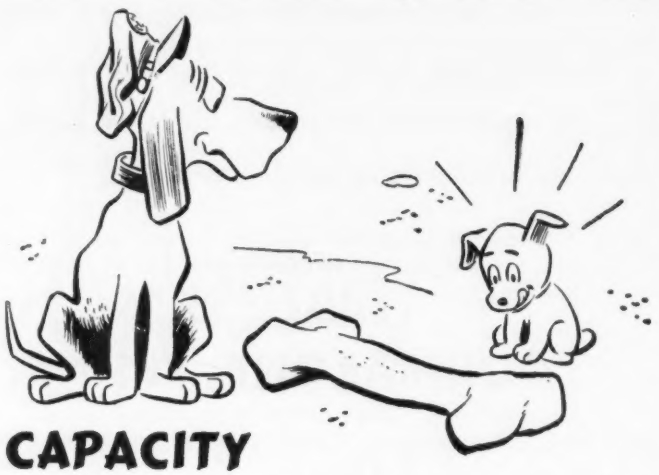

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necessary to give washed glassware a distilled water rinse before use. CRC claims that glassware machine-washed with a high wetting-action detergent retains less than one part per million of ionized salts from ordinary tap water.

•

Fungus Protection: A group of bactericidal-fungicidal salts of N-nitroso-N-phenylhydroxylamines has been newly patented (U.S. 2,635,978) by Sharples Chemicals' (Philadelphia, Pa.) John Massengale. Included: the ammonium, aluminum, copper, iron, sodium, and zinc salts of N-nitroso-N-phenylhydroxylamine; the ammonium salt of N-nitroso-N-2-chlorophenylhydroxylamine and the copper salt of N - nitroso - N - 3 - chlorophenylhydroxylamine.

•

Pollution Fighter: Algae are the newest allies of pollution-control researchers. Workers at the Academy of Natural Sciences (Philadelphia) have developed a new device, using the one-celled organisms, for continuously recording the degree of river water pollution. Called the Catherwood dilatometer, the apparatus indicates what is happening to aquatic life by measuring changes in number and kinds of algae in polluted water.

•

Spectrochemical First: The first extensive compilation of emission spectrochemical methods is now available (for $5.15) from American Society for Testing Materials (Philadelphia, Pa.). Result of an ASTM committee program on emission spectroscopy, the volume blueprints over 50 laboratory procedures in this field.

•

Synthetic Perfumer: Newest offering of Shulton, Inc.'s (New York) fine chemicals division is the perfume agent rhodinol—2,6-dimethyl octenol. According to Shulton, the material is manufactured from readily available raw materials, sells for approximately half the price of the traditional Geranium Bourbon rhodinol. Intended as a replacement for natural rhodinol in perfume compositions, the synthetic—in Shulton's words—"possesses a full, rich, typically red-rose note and the warm, spicy character usually associated with rhodinol made of . . . Geranium Bourbon Oil."

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Micro Speeder: Fisher Scientific Co. is currently spreading the word of its new Micro Gram-atic balance. Latest of the Fisher Gram-atics, the new balance is air-damped, eliminates the need for determining sensitivity before each weighing.

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Foreign Trade: A Fair, Fast Course

Ever sensitive to changes in the economic weather overseas, McGraw-Hill International Corp. constantly keeps an eye out for indications as to which way the export wind is likely to blow. Here's its latest report on the export outlook:

In the accompanying charts are depicted (1) the records, (2) the hopes, (3) the fears of hundreds of U.S. manufacturers and exporters whose livelihood depends at least partly on doing business overseas.

Coming at a time when many economists, basing their conclusions on business trends and indicators, are inclined to discount the export trade, the survey presents refreshing contrast.

True, the particular groups covered by the survey represent fields generally conceded to have the brightest export outlook. True also, some of the conclusions, particularly opinions dealing with the future, are necessarily qualitative in nature.

But this much can be said concerning the respondents' replies:

- More than half admitted volume declines in the first half of 1953.
- More than half had experienced a decided upswing during the second half of last year.
- A pale but definite hue of optimism concerning the 1954 outlook suffused a majority of replies. Fifty-five percent of the repliers expected a rise in volume; 30% indicated no change from 1953 levels and only 15% looked for decline.

And how did the pharmaceutical and chemical makers and traders, as a group, stack up to their confreres in the other major groups? Quite well (*see Chart 3*). Only 8% predicted that their export business would not hold up at today's lively clip.

Just how good trading will be in specific chemicals is more of a moot question. Detailed inspection of the pharmaceutical-chemical answers showed these divergencies:

- In order of percentage of optimistic replies: pharmaceuticals scored highest; specialties, next; organics followed; and heavy basic chemical suppliers were least sanguine.
- Quantitatively, where respondents made any estimate at all, the increase in volume predicted for 1954 over second-half 1953 ranged from 2% to about 20%; the highest figures were offered by detergent suppliers.

As was summarized in the reply (*see Question 4*), most fingers pointed toward Latin America as the land of most export promise.

As evidenced in Chart 5, a great majority of the replies acknowledged that foreign competition was already being felt and was expected to grow hotter.

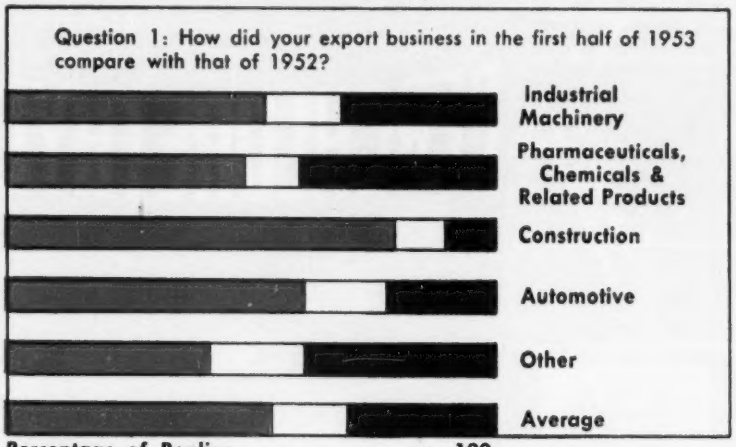
But almost nobody believed that trade ahead would be a shoo-in. Chief competitive problems mentioned were (1) price warfare, (2) credit terms.

Just as they led the field in frequency of optimistic outlook, the pharmaceutical and chemical makers likewise led all the rest in (1) acknowledging competition, (2) girding themselves for greater sales efforts. No less than 90% (*see Chart 5*) admitted they were getting a battle from foreign or local manufacturing. But in the next breath (*Chart 6*) most (88% to be exact) avowed they were stepping up their own exertions.

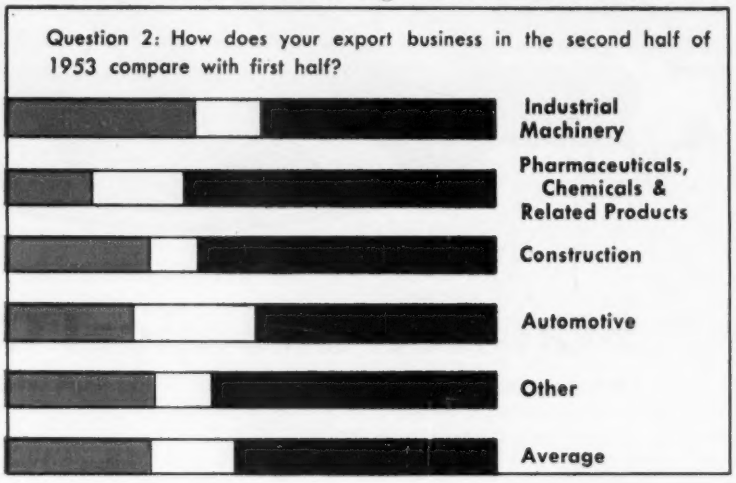
Over-all, the pattern was similar throughout all responses.

- All groups showed optimism.
- All looked for accelerated pace of competition and were determined to meet the economic foe.
- All groups claimed that, in view of changing domestic and foreign conditions, their interest in foreign markets will continue to increase.

Business was down early this year . . . . . .


Question 1: How did your export business in the first half of 1953 compare with that of 1952?
Industrial Machinery
Pharmaceuticals, Chemicals & Related Products
Construction
Automotive
Other
Average
Percentage of Replies 100

. . . . . but improved during last six months . . . . . .


Question 2: How does your export business in the second half of 1953 compare with first half?
Industrial Machinery
Pharmaceuticals, Chemicals & Related Products
Construction
Automotive
Other
Average

THE PERKIN-ELMER
INSTRUMENT DIGEST

A condensation of some articles in the Fall issue of THE PERKIN-ELMER *INSTRUMENT NEWS*, a publication of The Perkin-Elmer Corporation, manufacturers of scientific instruments—Infrared Spectrometers, Tiselius Electrophoresis Apparatus, Monochromators, Flame Photometers, Continuous Infrared Analyzers, Amplifiers, Astronomical Equipment, Thermocouples, Lenses, Crystal Optics, Special Designs for the Government.
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Norwalk, Conn. | January, 1954 | Vol. 5, No. 1

From Cooking Oils to Aromatic Mixtures: Process Stream Problems Handled Successfully with Bichromator Analyzer

Infrared analysis today occupies an important position in control laboratories serving most process plants. More recently, infrared process stream analyzers such as Perkin-Elmer's TRI-NON and BICHROMATOR Analyzers are gaining rapid acceptance as the ability of these instruments to increase operating efficiency becomes more widely understood.

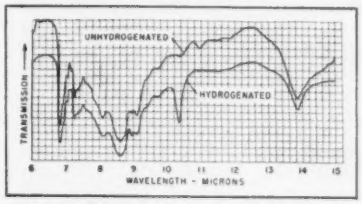

Fig. 1. Spectra of commercial unhydrogenated and hydrogenated vegetable oils.

• **Non-Dispersion vs. Dispersion**—Non-dispersion instruments such as the TRI-NON Analyzer have received the most attention principally because of their apparently greater simplicity. And in many applications the non-dispersion approach does provide the best solution. There are cases, however, as when liquid streams must be analyzed, where the more conventional dispersion principle of measurement has distinct advantages.

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Hydrogenation of Edible Oils

• **One Application of the Bichromator**—This is one application of the BICHROMATOR Analyzer to a batch process. Under the usual temperature, pressure and catalyst conditions, hydrogen tends to add to the more unsaturated triglycerides to produce trans-isoleic triglycerides. The starting materials—cotton-seed oil, soybean oil or corn oil—have essentially the same infrared spectra (fig. 1). Hydrogenation produces only one marked change—the appearance of the prominent trans band at 10.3 microns. With this, the process is followed easily and accurately.

• **No Further Adjustment Required**—Wavelengths were set up on the Model 112 single beam spectrometer using *Wesson Oil* as 0 percent and *Crisco* as 100 percent hydrogenation. These wavelengths were used on the BICHROMATOR Analyzer without further adjustment. Calibration curves are shown in fig. 2. The one marked Model 112 is a normalized curve predicting BICHROMATOR performance; the other is actual Analyzer calibration. The slight difference in the two curves is due to the somewhat wider spectral slit widths used in the BICHROMATOR Analyzer.

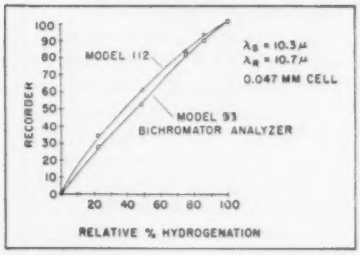


Fig. 2. Calibration curves for hydrogenation of edible oils.

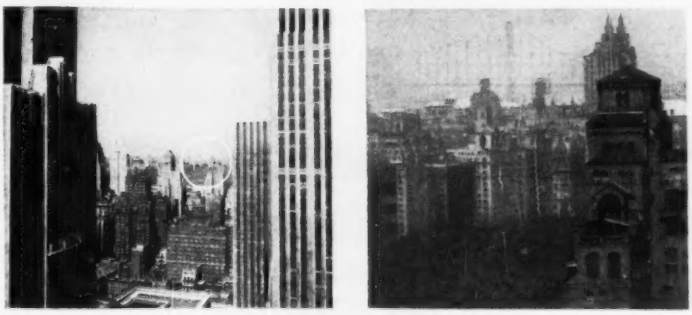
One of 3 applications described in Fall '53 Instrument News.

Infrared Analysis: An Economic Asset to the Small Refinery

At the Cargray plant of the Panoma Corporation in White Deer, Texas, the through-put is approximately 110,000,000 cubic feet of natural gas per twenty-four hour day. Refined products include propane, isobutane, normal propane, isopentane, normal pentane and automotive gasoline. An infrared spectrometer has been in service for more than two years and Cargray is thoroughly convinced of its usefulness. Initial installation cost in June, 1951, was $5,923.32. Since, only $409.84 was spent on maintenance materials. Cost per analysis and instrumental maintenance costs were considerably lowered.

Digest of an article by Paul T. Buchanan in the Fall 1953 issue of Instrument News.

Image clarity through six miles of haze



One muggy July day last summer, William Vandivert, former Life photographer, took a Perkin-Elmer 36" aerial lens to an empty office in Rockefeller Center, pointed it at the George Washington Bridge six miles away, and got the picture at the right above. By way of comparison, he shot a similar picture through an expensive 2¼ x 2¼ miniature camera (focal length: 75mm) shown at the left. Both illustrations are shown without enlargement. The area of the bridge is circled in the smaller photo.

Although the George Washington Bridge stands out clearly through the summer haze on the photograph taken with the P-E aerial lens, the bridge cannot be seen at all on the miniature camera photo.

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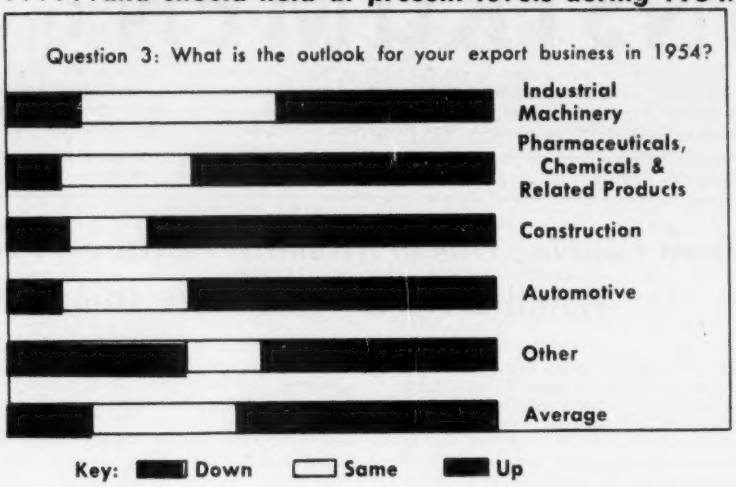
(Story begins on p. 34)

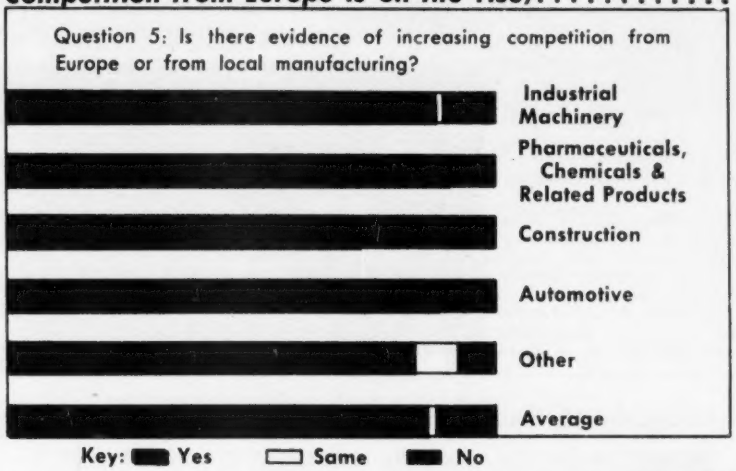
. . . . . and should hold at present levels during 1954.



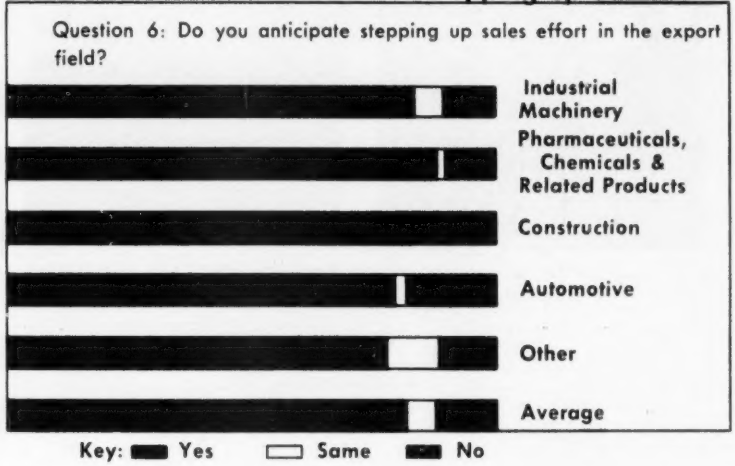
Question 4: What areas do you see as your best markets for 1954?

All answer: Latin America

Competition from Europe is on the rise,. . . . . .



. . . . . but we are also stepping up our efforts.



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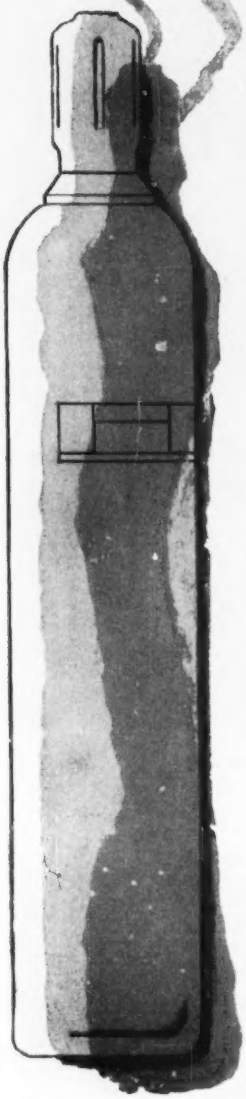

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- Chromium Fluoride
- Fluoboric Acid
- Fluorine Cells
- Fluorinating Agents
- Frosting Mixtures
- Hydrofluoric Acid Anhydrous
- Hydrofluoric Acid Aqueous
- Hydrofluosilicic Acid
- Potassium Bifluoride
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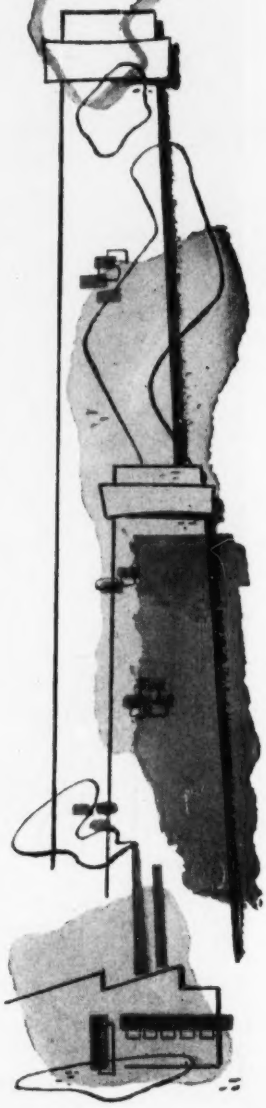

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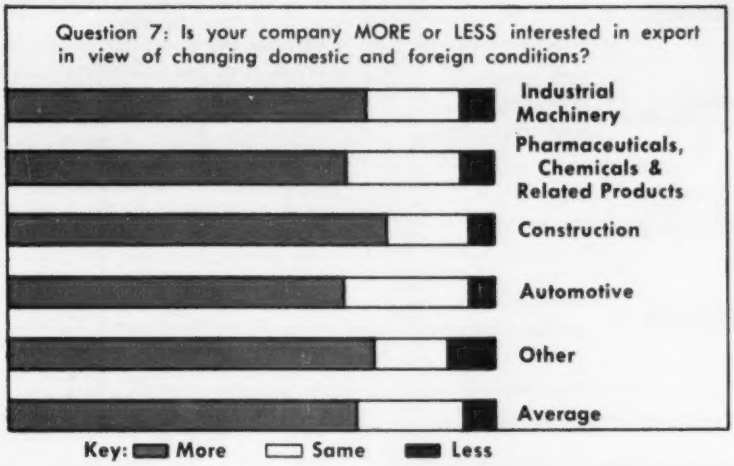

(Story begins on p. 34)

Earthbound Optimism

Now that most 1954 contracts have been negotiated, chemical industry spokesmen are pretty much agreed that the hayride's over for the salesman. With production geared to an all-time high and scheduled to mount next year, marketing is becoming the industry's biggest hurdle. But despite the predicted rougher riding, most sales managers are confident they're ready for any bumps ahead.

In an effort to determine just how much emphasis management is placing on the "get out and sell" theme, CW polled a representative cross-section of the chemical industry last week. Almost without exception those questioned admit their concern over sales prospects ahead—agree that the Korean plush-profits days have faded as completely as last summer's suntan. One coal chemicals sales manager illustrates the change this way:

"Last year at this time optimism was extreme. Now there's still optimism, but it's more earthbound.

"To take a case: when we asked one of our customers last year what his 1953 needs would be, he named '5 million lbs.' As it turned out, he bought only 2½ million lbs.

"When asked this time what his 1954 needs would be, he gave us a figure closer to 2½ million."

This note of realism is typical of the current attitude toward next year's business. Other responses:

• "Our actual sales look to be as good as last year. The quantities involved will not be much different."

• "Except in cases of discontinuance or where a customer is now making his own product, we have no examples of reductions in contracts."

Matter of Size: More than two-thirds of the companies polled agree that next year will be tougher selling—especially if present production holds firm and expansion plans go through on schedule. The combination adds up to bigger output, smaller profit, more sales effort.

If there's any difference in outlook, the larger companies are voicing a bit more pessimism. Possibly accounting for their more sober evaluation:

• By virtue of their size, big corporations are strapped by heavy overhead, especially when profits begin to dwindle.

• With large product lines ranged over a broad field, including basic chemicals, the traditional buyer's market pinch is likely to be felt at some point or other.

In contrast, a small company, finding itself in at least temporary position of producing an item currently in demand, is quite likely to view the future more roseately.

With orders stacked, waiting to be filled, it's hard for any sales manager to credit tremors of overproduction in other sectors of his industry—often as far afield from his own center of interest.

Grounds for Action: CW surveyors found that to get a line on what their sales patterns will be next year, chemical companies all have their own

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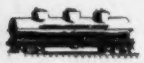

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special formulas. Sources of information vary widely; the big trick is how to put the facts together.

And regardless of the mechanics involved, some one still has to "make the big guess." Backbone of most systems: on-the-spot evaluations by salesmen themselves; company surveys; periodic pulse-taking by industrial publications and associations.

Steps being taken on the basis of the coming sales scramble fall into several groups: Managers say they're:

- Keeping a checkrein on inventories. Example: one medium-size industrial chemical company, while not particularly pessimistic, nevertheless has reduced its inventory 45% in the last 9 months . . . hopes the action wasn't necessary, but doesn't want to be "out on a limb."
- Watching for any changes in tariff and tax rates. One small manufacturer of intermediates, with several overseas customers, for instance, feels that tariff rates are one of most important barometers for sales.

Regarding tax rates, the sales manager of a company serving the food industry reasons this way: that (1) business always depends on the consumer, (2) people have more money and larger savings than they ever had, (3) when and if income taxes are lowered, we'll see long-deferred spending sprees.

- Giving the customers' needs closer attention. "A year ago," reminisces one manager, "our men could go into a customer's office and ask 'What can you use that we sell?'. Now we insist that our men get to know what customers need, in what directions they are expanding."
- Supervising salesmen closely:

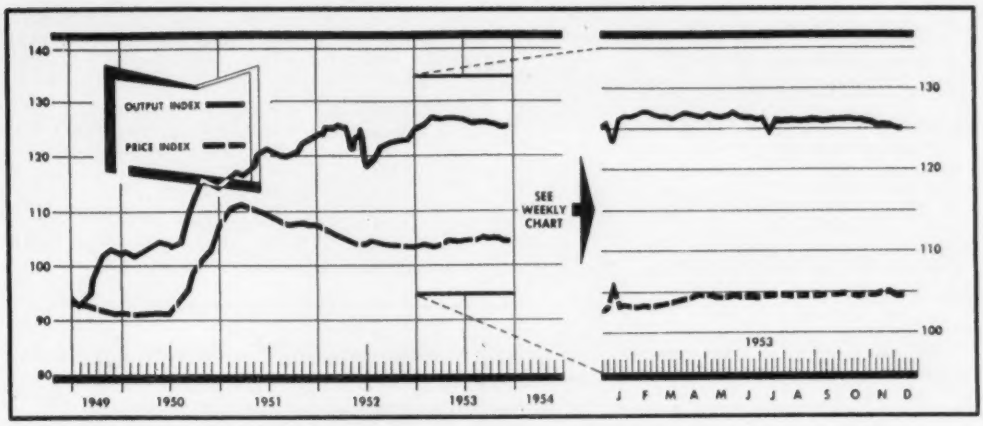
"For the past few years we've let our boys 'rock along' on their own. Now we're working with them, generating selling ideas, tactics."

Cautious Courage: Beneath all the evidence of careful planning, however, a confident optimism prevails. One official of a large industrial chemical company summed up the situation in these words:

"Sure it's going to be a dogfight in '54 . . . but we're ready, and I think the industry at large is ready. We've all been expanding to meet the increased demand of the past few years . . . and it stands to reason that when the new facilities get rolling, we're all going to have to pitch to move stocks.

"I don't see anything that says that '54 is going to be a bad year, though. I'm sure it'll be as good as or better than '53 if we keep on our toes."

MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

The chemical market place may still be exuding a holiday urbanity, but the tinseled benevolence effectively screens some shrewd market maneuvers. For now—and through the next few weeks—contracts for 1954 chemical deliveries are being signed.

On the one hand, buyers are hopping on every indication of softening prices to wangle concessions, while on the other, sellers—convinced that current easing is of a temporary nature—are conjuring up visions of tightening market conditions.

•

Whether or not formaldehyde is one commodity soon due for a further firming may be moot, but at the moment most producers aren't too unhappy over consumption levels. Plywood and plastics consuming industries' demand is holding up, formaldehyde prices seem firm, and are likely to remain so.

At least one big-time dissident, however, reports some demand-wobbling, figures formaldehyde is undergoing the same general slackening noted for most other chemicals.

•

Slackening of a different sort—this time government easing of its toluene take—is about ready to happen. Uncle Sam this month is beginning to back out of the market (CW Market Letter, Nov. 14, '53). Stockpile requirements for aviation gasoline will likely be met by spring; purchases for other government programs are also heading for a gradual curtailing.

The cutbacks in military allocations presage a more than ample supply for civilian consumers, for indications are that bottled-up industrial demand is not strong enough to blot very much of the output the government will pass up.

Market observers, too, see a definite possibility that the added-to-the-market toluene will exert some downward pressure on price schedules—but don't look for it to happen in the immediate future.

•

In the nonferrous metals market, zinc observers see little chance

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	124.5	124.6	123.0
CHEMICAL WEEK Wholesale Price Index (1947=100)	105.1	105.0	103.0
Bituminous Coal Production (daily average, 1,000 tons)	1,340.0	1,398.0	1,723.0
Steel Ingot Production (1,000 tons)	1,674.0 (est.)	1,444.0 (act.)	2,226.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	267.1	269.1	260.2

MONTHLY INDICATORS—Foreign Trade (Million Dollars)	EXPORTS Latest Month	EXPORTS Preceding Month	EXPORTS Year Ago	IMPORTS Latest Month	IMPORTS Preceding Month	IMPORTS Year Ago
Chemicals, total	70.5	77.5	61.7	22.0	21.8	21.0
Coal Tar Products	4.5	5.1	3.8	3.0	3.0	3.3
Medicinals and Pharmaceuticals	19.5	21.0	17.2	0.5	0.5	0.7
Industrial Chemicals	10.6	11.3	9.7	5.5	5.5	4.6
Fertilizer and Fertilizer Materials	4.7	3.7	3.4	9.5	9.0	10.5
Vegetable Oils and Fats, Inedible	2.5	1.8	2.5	4.4	6.7	6.8

of a hike in the current low prices (10¢/lb., St. Louis; 10½¢, N.Y.). Reasons: heavy stocks held by producers; continued lag in consumer buying. The latter, of course, is prompted by the usual year-end inventory adjustments. Many customers operate on a "last in, first out" accounting method, are currently trying to clear out higher-tagged stocks.

Chances are good, though, that this month will see a pickup—if not in prices, then at least in sales.

•

Late last week acrylonitrile prices took another tumble—the second in four months (CW, Aug. 22, '53). The latest reduction—which brings the tank car price down to 31¢—was posted almost simultaneously by major producers Monsanto and American Cyanamid.

Behind the cuts: recent ethylene oxide price reduction, a hike in acrylonitrile capacity when American Cyanamid's Fortier (La.) plant is completed—probably this quarter.

•

And last week, too, the Natural Rubber Bureau tossed out some less-than-heartening statistics in estimating 1954's world new rubber production and consumption. The curve is down for both natural and synthetic rubber, says the bureau, but the latter is due for the deeper dip.

Total output for this year will hit 2,450,000 tons (compared with 1953's 2,630,000 tons), and of the expected 180,000-ton decline, the synthetic dip will account for all but 10,000 tons.

In the consumption column, natural rubber is slated to remain at last year's 1,560,000-ton level, while synthetic use will fall off by some 100,000 tons—860,000 tons in 1953 vs 760,000 in 1954.

In the report, outgoing president Warren Lockwood fires another round in the group's continued barrage for higher GR-S prices, again urges that the government-fixed 23¢/lb. price be boosted now.

•

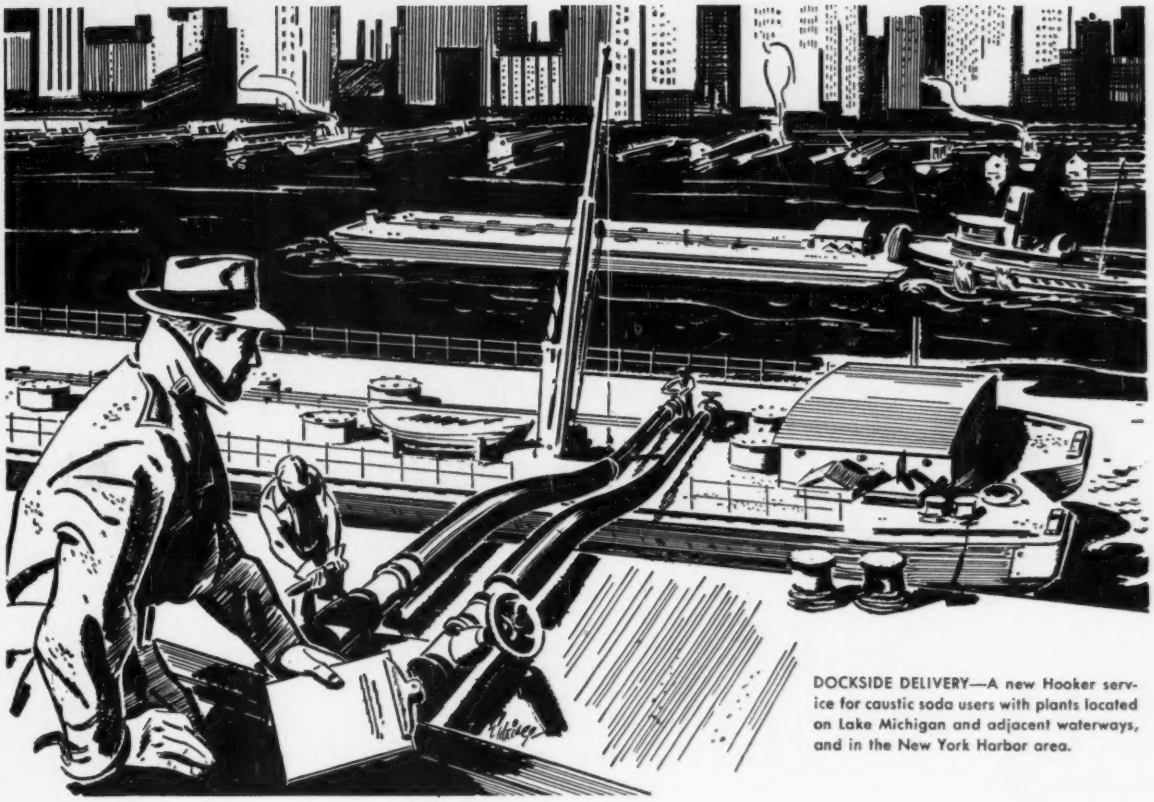
Polystyrene producers are finally getting around to altering the molding material's price structure. Most of the changes—scheduled to go into effect early next week—actually boil down to a double-pronged cost-shaver: abolishes inequitable variations in shipping costs to consumers; cuts producers' cuts by discouraging small-batch runs.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 28, 1953

DOWN

	Change	New Price		Change	New Price
Antimony oxide, bgs., c.l., frt. alld.	$ .015	$ .275	Tin chloride, stannous anhy., dms., wks.	.006	.824
Naphthalene, ref. ind., dom. tanks, frt. eqld.	.01	.0975	Tripentaerythritol, bgs., l.c.l., wks.	.025	.37

All prices per pound unless quantity is stated.



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BDSA Benzene* End-Use Pattern 1950-1952

(Millions of Gallons)

	1950	1951	1952
Production	180[1]	240[2]	225[2]
Imports	16[3]	41[3]	36[3]
Supply—Total	196	281	261
Phenol	45	57	50
Styrene	64	84	83
Aniline	13	17	13
Maleic anhydride	5	7	5
DDT	11	15	14
Synthetic detergents	12	15	16
Benzene hexachloride	5	8	6
Chlorobenzene (di and mono[5])	13	17	16
Miscellaneous[6]	23	57	58
Estimated consumption—Total [4]	191	277	261

(*Including Motor Type)

(1) As reported to the Chemical and Rubber Division by the various companies on Form NPA-25. Differs from benzene production for 1950 as published by the Tariff Commission due to differences in grade and types of petroleum fractionation.

(2) Represents adjustment of Tariff Commission data from companies. (See latter part of Note (1)).

(3) 1951 and 1952 benzene imports are based on specific company information furnished to NPA's Chemical and Rubber Division. These data differ from Census Bureau benzene imports due to Census inclusion of various crude benzene grades not normally considered as benzene. 1950 data were estimated to secure information on a refined benzene basis so as to afford comparability with 1951 and 1952.

(4) Based on production adjusted for differences in year-end producer stocks, assuming consumer stocks as relatively constant; plus imports adjusted for differences in December deliveries.

(5) Refers to monochlorobenzene for uses other than as an intermediate for phenol, aniline and DDT.

(6) Combines several end-uses of benzene, the disclosure of which may indicate the extent of individual company data. Also includes nitrobenzene for uses other than as an intermediate for aniline.

Further, the end-use breakdown for 1950 is based primarily on individual company reports to the Chemical and Rubber Division for that year. Similar data for 1951 and 1952 represent projections of the 1950 figures chiefly in terms of changes in production.

So Goes Benzene

Benzene producers—as well as most other chemical marketers—this week will be studying the first of a series of Business and Defense Services Administration distribution patterns. And though the long-heralded report on benzene will blaze the trail for some 55 other chemical use-breakdowns, first-wave reaction of industry observers can be summed up this way: "Not bad—but it could be better."

For although the pattern was expected to pinpoint a number of benzene outlets hitherto shrouded in anonymity under a catch-all "miscellaneous" category, it's a fact that many of these uses are still buried.

It is fairly obvious, too, that BDSA has been walking a slender tightrope. The report is in effect, a compromise. On the one hand, the agency has taken into consideration suggestions from some benzene users that it not reveal certain information about exclusive market outlets which the government—via NPA and other agencies—had previously garnered under a confidential cloak.

On the other hand, BDSA's Chemical and Rubber Division Chief Norman Hathaway has tried—and to a great extent succeeded—to satisfy a long-felt need for some dependable end-use figures which should do much toward leveling out traditional peaks and valleys in chemicals production.

Many market researchers have in the past whipped up some near-accurate guesses on benzene end-uses. Basis has usually been Tariff Commission figures, production and import data from the Census Bureau, and vital available statistics on some of the principal benzene takers, such as phenol, styrene.

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Vacuum Double Drum Dryer, recent model, preferably 24"/48", with Chrome Plated Drums, top feed, splash hood, material guide shields, material screw conveyor. M. L. Riskey, Nutrilite Products, Inc., 5600 Grand Avenue, Buena Park, California, LAwrence 2-1181.

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Ball Tube 3' x 6', Kennedy Van Saum Continuous, air-swept mills, with drive, feeder, fan and steel balls. Perry Equip. Corp., 1415 N. 6th, Phila. 22, Pa.

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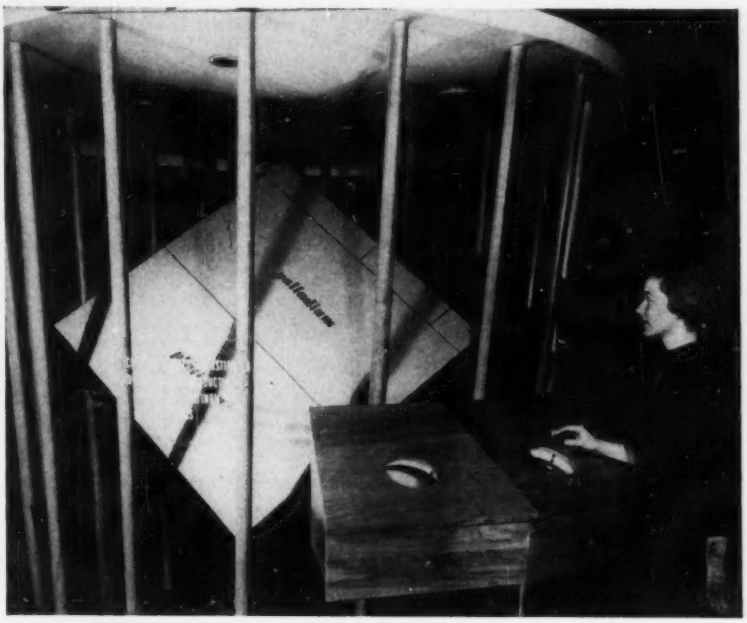
But such market men have not had access to detailed files of these agencies, have often been stymied by the elementary question: Just what is or is not benzene? That there is some differences of opinion is pointed up by BDSA's distribution data (*see table explanatory notes*).

Despite the points of contention, however, this much is certain: because of the bloated "miscellaneous" classification, benzene probably was not the best item with which to start the end-pattern series, but it is a start—and the figures can be tabbed the most nearly accurate now available.

Hindsight, of course, is just a half-turn to foresight. BDSA's Hathaway, with an oblique reference to the fact he is leaving the agency come February, makes the comment that any market man who feels dissatisfied with the benzene report should wait for other reports before passing judgment. "As a sales manager," he adds, "I'd want to see them."



ALL IN ONE: A 43-in. cube equals the world's output of six metals.

Minikin Millions

Right now at The Franklin Institute in Philadelphia, chemical process people—as well as the general public—may gape at a revolving 43-in. cube that represents some $50 million worth of raw materials. A fact that makes the sight even more impressive: that relatively small cube also represents an estimated year's world production of six vital metals—a total of only 23 tons.

Purpose of this particular display (set up by the International Nickel Company), is to dramatize the rarity of the platinum group metals, platinum, palladium, rhodium, ruthenium, iridium and osmium.

As might be expected, the U.S. is the principal consumer of these metals. In recent years this country's take has amounted to about two-thirds of the global output. For example, U.S. industry last year bought about 456,000 troy ounces. Topping the list of major users: chemical, electrical, dental jewelry industries.

Though pinpoint figures are not available the annual precious-metals pie is usually cut up as shown in the table.

U.S. Consumption of Platinum Group Metals
(in troy ounces)

Industries	Platinum	Palladium	Total of 4 others*
Chemical, electrical	186,000	146,000	16,000
Jewelry, dental, other purpose	32,000	67,000	9,000

* Rhodium, ruthenium, iridium, osmium.

The exhibit called "Platinum Metals—Man's Versatile Servants," which will run indefinitely, also uses dioramas to visualize the everyday applications of the rare metals. Principal outlets are in production of glass fiber, rayon, nitrates for fertilizer, high-octane gasoline, vitamins, fountainpen points, aircraft spark-plug electrodes, and contacts for telephone system relays.

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Titanium Too Tight

Like a man undoing the top button on a too-tight shirt, the government is opening up its expansion goal for titanium sponge. Deciding that it is more than a matter of improper channeling (*CW, Nov. 7, '53*), ODM is lining up an estimated $100 million-plus for plants and equipment to boost over-all output to 35,000 tons/year by 1956—a 10,000-tons/year jump. General Services Administration figures to have signed contracts for the additional tonnages by March 31.

The 35,000-tons/year goal originally had been recommended by the Pentagon two years ago. ODM, however, cut the figure to 10,000 tons, later raised it to 22,000 and then to 25,000.

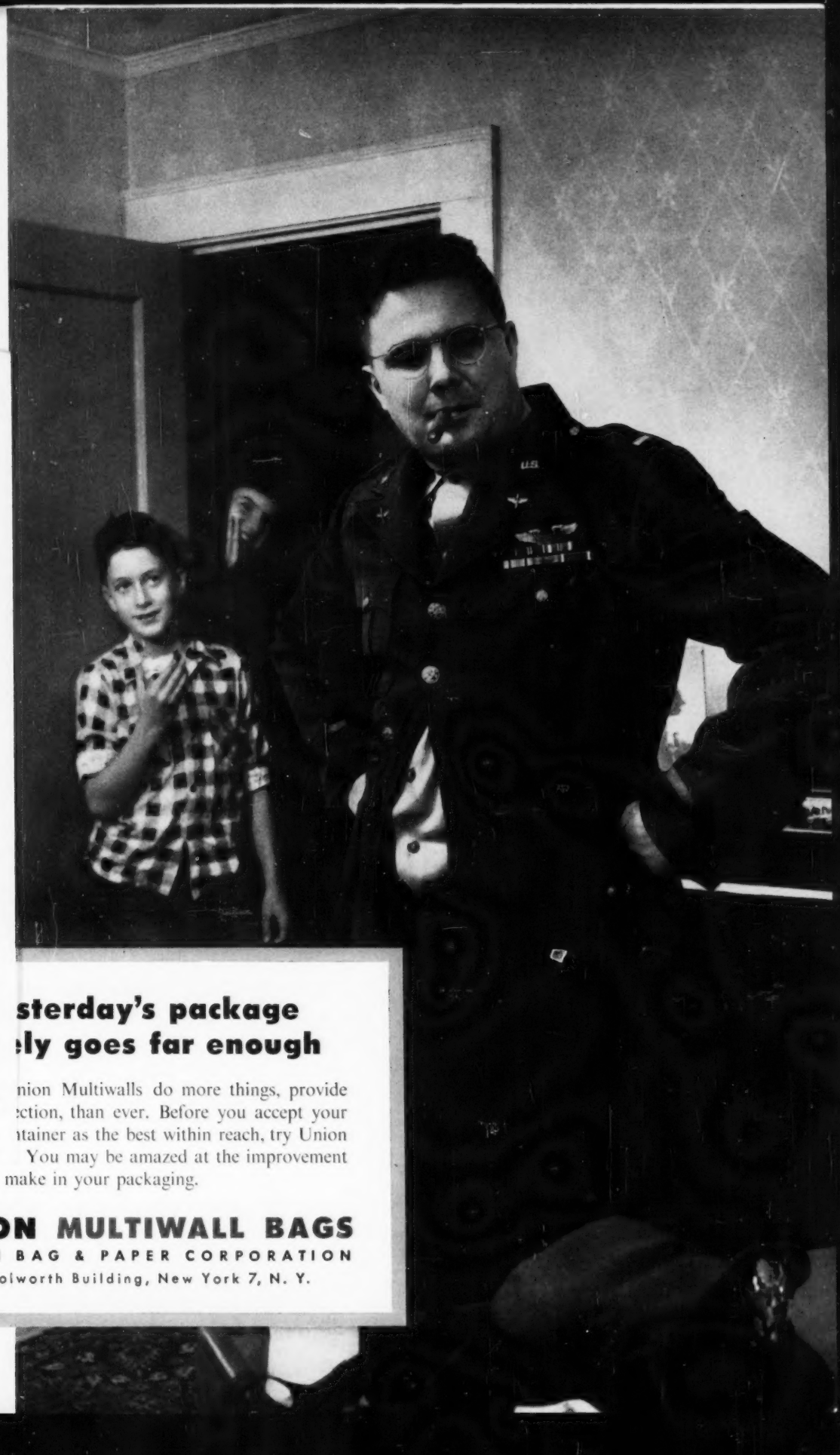
New producers weren't sufficiently qualified, declare ODM and GSA officials, to justify heavy advances of government money.

ODM and GSA plan to modify their original program to meet the new goal. Figuring at first to bring about 10 producers—with four different processes—into sponge production, officials say they will now try for the 35,000 tons/year with only about five firms. The five will all use modifications of the Kroll magnesium reduction process—soon to be obsolete. Under ODM's program, however, a titanium producer's indebtedness is cancelled if the Kroll equipment becomes obsolete during the contract.

Too, new GSA titanium contracts call for cash advances against future production, fast tax write-offs on new plants, and market guarantee arrangements. Leading candidates for the new contracts: Titanium Metals Corp., Du Pont and Monsanto. Electromet Div., Union Carbide, is also said to be interested, has future plans calling for private investment in a 10,000-tons/year plant. The plant would use a new process, and the company would seek only a market guarantee and tax write-off from the government.

Du Pont and TMC already hold contracts to produce 3,600 tons each. The only other company in the expansion program, Cramet, holds a similar contract for 6,000 tons/year but is not yet in production. Actual production for 1953, however, fell short of contract, is estimated at 2,400 tons including small pilot sponge output.

As one market man observed, there's no use in moving the collar button over any further, it's time for a new shirt.



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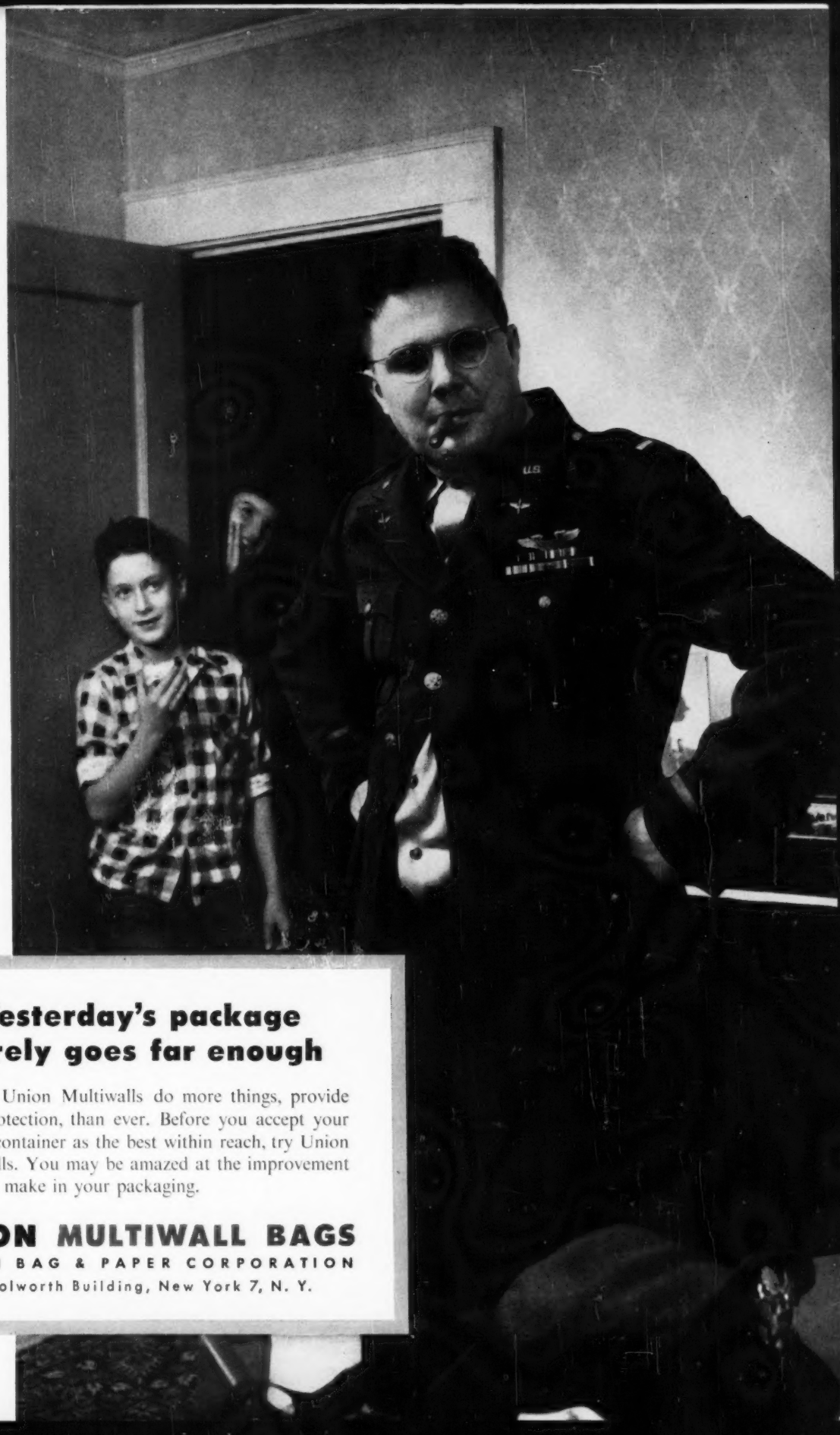

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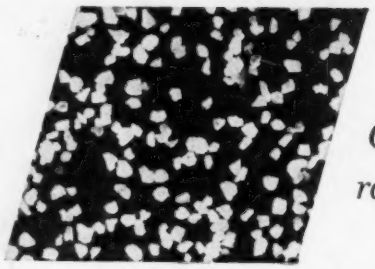

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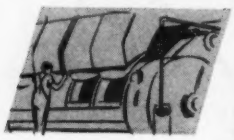

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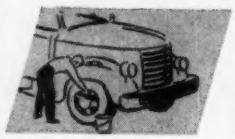

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